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OFFICIAL GAZETTE

of the UNITED STATES PATENT AND TRADEMARK OFFICE

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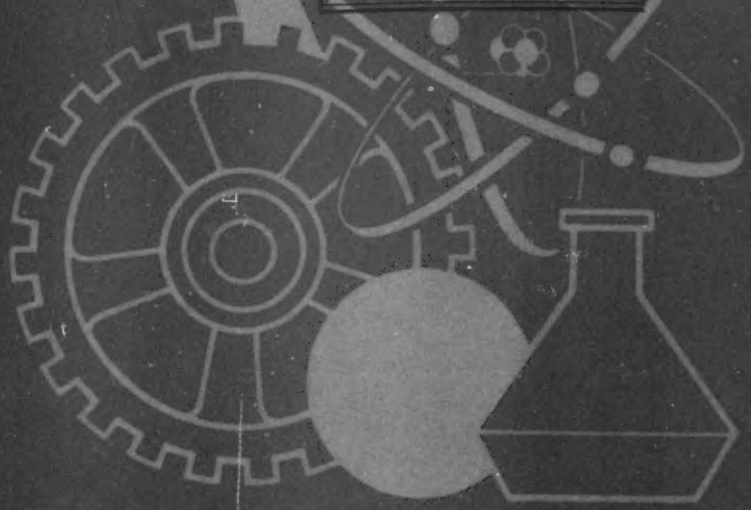

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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

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TRADEMARK REGISTRATION TREATY

Implementing Legislation

On September 3, 1975 the Trademark Registration Treaty (TRT), signed at Vienna, Austria, on June 12, 1973, was transmitted by the President to the Senate of the United States with a view to receiving its advice and consent to ratification. Legislation designed to implement the TRT has been prepared by the Patent and Trademark Office in the Department of Commerce.

Following a suggestion by the General Accounting Office, the Patent and Trademark Office is planning a survey of a random sample of United States trademark owners who would have a direct interest in the TRT and in the changes required in United States trademark law. In order to provide the interested public with the information on which the sampled companies will base their responses, the complete draft legislation, including Summary, Statement of Purpose and Need and Sectional Analysis is reproduced below. A copy of the survey questionnaire will be published in a future issue of the OFFICIAL GAZETTE.

The text of the TRT was reproduced in the OFFICIAL GAZETTE *of July 24, 1973. Some post conference documents, including a history of the Treaty, were reproduced in the* OFFICIAL GAZETTE *of February 11, 1974. The report of the United States delegation to the Vienna Conference was reproduced in the* OFFICIAL GAZETTE *of February 11, 1975. Additional copies of the material reproduced below as well as the previous* OFFICIAL GAZETTE *publications are available upon request to the Commissioner of Patents and Trademarks.*

DONALD W. BANNER,
Commissioner of Patents and Trademarks.
Date: July 11, 1978.

SUMMARY

In 1973, the United States and thirteen other countries signed the Trademark Registration Treaty. This Treaty was transmitted to the Senate on September 3, 1975, with a view to advice and consent to receiving its ratification.

The Trademark Registration Treaty will establish an international trademark filing arrangement, through which persons and companies residing in one of the member States can more easily register trademarks (including service marks, and collective and certification marks) and maintain these property rights in all of the member States. Since the Treaty is not self-executing, the instrument of United States ratification will not be deposited until the necessary implementing legislation is enacted.

The proposed implementing legislation effects the necessary changes in the trademark statutes and provides to persons filing domestic applications the same benefits in the United States as those accorded under the Treaty. The implementing legislation would not come into force until the Treaty enters into force. Entry into force requires the deposit of instruments of ratification or accession by five States.

STATEMENT OF PURPOSE AND NEED

The enclosed bill would amend the Trademark Act of 1946 (60 Stat. 427, as Amended, 15 U.S.C. 1051 et seq.) to implement the Trademark Registration Treaty and make certain of its benefits available to persons filing national applications for United States trademark registration.

First, the bill would implement the Trademark Registration Treaty (TRT), an agreement adopted on June 12, 1973, by the Vienna Diplomatic Conference on Industrial Property to facilitate the protection of trademarks used or intended to be used in international commerce. This Treaty was signed by the United States and was transmitted by the President to the Senate of the United States on September 3, 1975, with a view to receiving its advice and consent to ratification.

Ratification of the Treaty and its implementation by this bill would enable United States nationals and residents to avail themselves of the advantages offered by the Treaty when it has entered into force with respect to the United States. In addition to the procedural implementing provisions, the bill would effect certain changes in the Trademark Act of 1946 (60 Stat. 427, as Amended, 15 U.S.C. 1051 et seq.) that are required to be made in order to comply with certain conditions and requirements of the Trademark Registration Treaty. These changes would not come into effect until the entry into force of the Treaty.

Second, the bill also makes modifications in the present law to provide to United States nationals and residents the same benefits when filing national applications for trademark registration in the United States Patent and Trademark Office as would be available to such applicants in the United States if filing under the Treaty.

Purpose of Trademark Registration Treaty

The Trademark Registration Treaty has as its primary purpose the establishment of a trademark filing arrangement through which persons and companies residing in one of the member States can more easily register trademarks (including service marks, and collective and certification marks) and maintain these property rights in all of the member States. Separate actions in approximately 150 jurisdictions (i.e. States, possessions, territories, etc.) are now required by United States companies in order to extend the protection of a trademark throughout the world. The complexity and high cost of establishing and protecting trademarks in international markets through the diverse national laws and procedures is a serious problem for businessmen seeking to further their commercial objectives by the sale of trademarked products across national boundaries. However, if trademark protection in potential foreign markets is not secured promptly, the unprotected mark is frequently appropriated by a "pirate" or may even be coincidentally adopted by another.

The entry into force of the Trademark Registration Treaty would help alleviate these problems by establishing an alternative international registration procedure through which the effects of national trademark registration in member countries could be secured, maintained and renewed on a central international register of marks. With a few exceptions, the effects of international registration in each participating State would remain subject to the substantive requirements of the national laws of such State.

History of Treaty Development

The Trademark Registration Treaty is the culmination of continuous efforts, since 1965, by the United States, to participate in an acceptable international arrangement to facilitate the protection of trademarks in international commerce. Consideration was first given to the possibility of United States adherence to the Madrid Agreement for the International Registration of Marks, a special arrangement under the Paris Convention for the Protection of Industrial Property. The Madrid Agreement, in force since 1891, has long operated successfully among twenty-three countries, principally European.

By 1968, it became apparent that there was substantial U.S. private sector opposition to adherence to the Madrid Agreement in its present form, largely because of certain of its features which, it was argued, would be contrary to the interests of United States firms.

From 1968 to 1970, there were efforts to revise the Madrid Agreement to correct these alleged deficiencies, but these efforts were not successful. However, whereas there was opposition to our adherence to the Madrid Agreement, interested private groups continued to urge United States participation in an acceptable trademark registration treaty.

In September, 1970, a United States sponsored resolution to develop a new trademark registration treaty was adopted unanimously by the competent administrative organs of the Paris Convention. After several drafts and examination by three Committees of Experts and several Consultants' groups, a final draft was considered at a diplomatic conference held in Vienna, Austria, from May 17 to June 12, 1973. Fifty States and thirty-one international organizations (governmental and non-governmental) were represented at the conference. On June 12, 1973, the Trademark Registration Treaty was signed by eight countries, including the United States, and remained open for signature until December 31, 1973, by which date a total of fourteen countries had become signatories. The Treaty will enter into force six months after five States have deposited their instruments of ratification or accession. To date, none of the signatory States has ratified the Treaty. Four States (Congo, Gabon, Togo, and Upper Volta) have deposited instruments of accession.

Main Features of Treaty

The Trademark Registration Treaty will establish a multilateral trademark filing arrangement for residents or nationals of its member countries, which provides easier procedures for securing, administering and maintaining national trademark registration effects in other countries by filing a single international application, securing a single international registration and maintaining a record of such rights on a central international register. International registration amounts to central recording of a "bundle of national rights" rather than a separate property right.

With some exceptions (as noted below), the substantive aspects of rights are regulated by each member State according to its national law. The main features of the Treaty are as follows:

1. A national or resident of a member State may file directly with the International Bureau of the World Intellectual Property Organization an international application designating the States in which protection of the trademark is desired. Any number of States, including the applicant's home State, may be designated.

2. The international application may claim the priority (Paris Convention "right of priority") of an earlier first application to register the same trademark.

3. The application is subject to an international fee plus a fee for each designated State (not higher than 100% of the total fees for national registration).

4. After a brief examination as to formal requirements, the trademark is registered by the International Bureau. The details of the international registration are promptly published in English and French in an international gazette and communicated to each of the designated States.

5. Unless refused by a designated State, the international registration is accorded the same legal effect as if the same trademark were registered nationally in that State. The time limit for the initial notice of refusal, including all reasons or possible reasons for refusal, is fifteen months from the date of the international publication. The reasons for refusal cannot be different from those applicable to national applications.

6. If initially refused by any designated State, the owner is notified of the refusal and is guaranteed the same procedural rights of re-examination and/or remedies available in the case of refusals of national trademark applications. Further proceedings are not subject to any Treaty time limits, and are carried out directly between the owner and the concerned national office.

7. The effects of an international registration may be cancelled in any designated State according to the national law of that State. The effect of cancellation is limited to the State in which the legal action for cancellation was brought.

8. An international registration may be renewed at ten year intervals by a single renewal application filed with the International Bureau.

9. States not originally designated may be added later by requesting the recording of later designations of the new States.

10. Assignments, changes of name, limitations of the goods and/or services, etc. may be recorded by filing a single international request, with the same legal effect as if recorded in the national registers.

11. Non-use of the trademark during an initial period of three years counted from the filing date cannot result in refusal or cancellation by any State. However, any State may require that the owner declare his intention to use the trademark in that State and may further provide in its law that no action for infringement may be commenced until the continuing use of the trademark in that State has started and that any remedy (e.g. damages or profits) may relate only to the period after use has commenced.

The benefits of the Treaty will be available only to nationals or residents of member countries. As to such persons, the Treaty may be used to secure protection in a few countries, or in many, depending upon the extent of the commercial interests.

The Treaty provides that the contracting States shall constitute a Union for the international registration of marks. The provisions for administration of the Union are similar to those established for the Patent Cooperation Treaty, which was transmitted to the Senate on September 12, 1972, and was favorably acted on by that body on October 30, 1973.

The Regulations annexed to the Treaty provide rules concerning administrative requirements and procedures and details useful in implementation of the Articles.

Interest of Other Countries

In addition to the United States, the signatories of the TRT include a number of major trading countries (e.g.

Federal Republic of Germany, United Kingdom, Italy, Sweden, Austria). Others are awaiting developments in the United States, which furnished primary impetus to the negotiations. In particular, the interest of most Western European countries is contingent upon United States ratification, primarily because of the existence of the Madrid Agreement. The Trademark Registration Treaty is more modern than the Madrid Agreement, has more advantages for trademark owners and eliminates features which have long inhibited the territorial growth of the Madrid system. However, the position of the Madrid Agreement members is dependent upon the interest of major countries outside that Union in the new arrangement. Of these, the United States is clearly the most important. However, Japan, United Kingdom, Canada, and the Scandinavian group are among other countries outside the Madrid Union which are known to be seriously considering participating in the TRT arrangement, or, failing that, in some other multilateral agreement, such as Madrid.

Main Advantages

The main advantages of the Treaty are the simplified procedures provided in order to secure national registration effects, to maintain the rights thereby acquired, and to continue these rights by renewal. Other benefits are the time limits for national refusal notifications and the limitations on national use requirements.

The Treaty will not be a panacea for all trademark problems. It will establish what is essentially a multilateral trademark filing arrangement, reserving (except for a few points) the substantive aspects of rights to regulation on a country-by-country basis under the national law of each country. However, by limiting participation to States having previously adhered to the Paris Convention for the Protection of Industrial Property, it assimilates or applies the norms and standards of trademark protection law which have been agreed to by the eighty-seven member countries of that Union over the almost 100 years of its existence. The fact that its filing, maintenance and administrative procedures are independent of national procedures means that a framework for future development of international substantive standards and further rationalization of procedures is provided. Also, since trademark piracy is best dealt with preemptively by prompt filing and diligent maintenance practices, the Treaty attacks this problem directly by facilitating the filing and maintenance procedures.

Even the short range objectives and benefits will not be immediately realized upon United States ratification. Five States must ratify before the Treaty enters into force. To date, only eighteen out of the eighty-seven potential member States have taken positive steps (i.e. fourteen signatories and four adherents). The benefits of simplified filing and maintenance will accrue in proportion to the number of member States.

Effect on U.S. System—Cost

As the Treaty matures in terms of the number of participating States, one of its effects will probably be an increase of foreign origin filings in this country (present foreign origin filings are less than 10% of total filings). It is fundamental that the benefits of simplification accrue in both directions. To the extent that any increased filings reflect existing commercial rights, this result would be consistent with a fundamental purpose of the federal trademark registration system, i.e. the central recording of marks in which rights may exist. Because registration is not mandatory in order to secure rights in a trademark in the United States (and this would not change under the Treaty), the U.S. system is designed to encourage federal registration, in order to provide centralized information to those searching for and selecting new marks for new products or services to be sold in commerce. Part of the increase, as explained later, may result from permitting the filing and registration of marks based on an intent to use as an alternative to actual use.

Since the intent to use amendments to be effected by the bill will not come into force until the date of entry into force of the Treaty, none of the financial consequences will accrue until after that date. It is assumed that entry into force will occur promptly after United States ratification, if not before that date. Assuming action by the 95th Congress, increased incremental costs and manpower requirements of the Patent and Trademark Office have been estimated as shown in the following chart.

ESTIMATED COSTS INCURRED BY RATIFICATION OF TRT AND ENACTMENT OF RELATED LEGISLATION [1]

[Dollar Amounts in Thousands]

	FY 1979		Adjustment for FY 1980		Total FY 1980		Adjustment for FY 1981		Total FY 1981	
	M.Y.	Dollar	M.Y.	Dollar	M.Y.	Dollar	M.Y.	Dollar	M.Y.	Dollar
Operational printing [2]		581.9		(+68.7)		650.6		(+54.8)		705.4
Operational, other [3]	21.7	420.3	(+11.6)	(+252.6)	33.3	672.9	(+7.4)	(+176.1)	40.7	849.0
Start-up [4]	3.0	109.8	(−2.0)	(−73.4)	1.0	36.4	(−1.0)	(−31.5)		[5] 4.9
	24.7	1,112.0			34.3	1,359.9			40.7	1,559.3

[1] These estimated costs will be partially offset by fees to the same extent as under our national system.
[2] Assumes additional publication of all applications will be required (see discussion of Sections 9 and 10 of bill in the Sectional Analysis).
[3] Includes supervisory, professional and clerical personnel, and mail.
[4] Includes Legislation and International staff, Organization and Systems, and all travel.
[5] Only travel remains.

An important caveat is that many of the assumptions on which the above estimates are based are, at this point, very speculative. Also, since the Treaty provides for the assessment of country designation fees (paid centrally) at a level equal to the fees for national registration, any increased operational costs of the Patent and Trademark Office due to increased filings will be offset to the same extent as under the national system. The above cost estimate does not reflect these partially offsetting fees.

Additional cost factors, too remote for attempting to estimate at this time, involve contributions to the World Intellectual Property Organization (WIPO) which will serve as the International Bureau under the Treaty. Article 34(5) of the Treaty establishes a working capital fund, constituted by a single payment made by each contracting State. Based on the experience in the case of other treaties administered by WIPO, it is believed that consideration of any working capital fund would be deferred, at least, until several years after the Treaty enters into force. The amount of the initial payment of each contracting State to this fund is computed with due regard to the number of international applications which are filed by residents of that State. Thus, a direct relationship exists between the amount of the payment by the United States and the use of the TRT by U.S. companies.

In starting up for operations under the TRT, the International Bureau will have to establish a budget financed from fees and charges for services rendered by the International Bureau, from sales of publications and other miscellaneous income. While the Madrid Agreement, also administered by WIPO, has operated at a profit for many years, and the TRT is designed to be self-supporting under normal circumstances (Article 34(4)), the possibility of deficits cannot be ruled out altogether. Deficits would be covered out of the working capital fund, which fund would then be reimbursed by the States. Deficits are not expected to be of any significant magnitude. Contributions to the working capital fund would be the responsibility of the Department of State.

Effect on U.S. Trademark Law

Participation in the international system will require that our national trademark law be amended in a number of respects. The most fundamental change is one which would permit the securing of a national registration in the United States based on intention to use the trademark applied for, and provide for an initial period of 3 years during which nonuse of the mark could not be a basis for refusing or cancelling such registration. Consistent with the Treaty, the proposed legislation provides that infringement actions in the courts would continue to be contingent upon the commencement of use, however.

As explained by the President in forwarding the Treaty to the Senate for its advice and consent, there is a sharp difference of opinion among interested persons, firms and associations in the United States as to the desirability of making this change, and, to a lesser extent, other less significant changes, required by the Treaty, in our national law.

The essence of the change in United States law is that it would move us from the strict use approach (today held to only by the United States, and a few other countries, e.g. Republic of Philippines, Panama) to the middle position, i.e. a use or intention to use system similar in principle to that of the British. The change is believed to be more consistent with the legitimate needs of businessmen, especially where international trade is contemplated.

Intention To Use Legislation

In fact, legislation permitting the filing of a trademark application based on an intent to use was widely supported in the private sector and, in the 91st Congress, identical House and Senate bills, substantially the same as the earlier Senate bills, were introduced at the request of the Administration (S. 3110, McClellan; H.R. 14050 Kastenmeier). This legislation was not reintroduced in the 93rd and 94th Congresses, however, since it was known at an early stage in the Treaty negotiations that the use requirements of the United States would be affected.

The support of intention to use legislation in the United States had its foundation in domestic concerns. Under present law actual use of a mark is a prerequisite to the filing of an application for registration. Thus, every applicant for federal registration, in addition to other requirements, must specify in his application the date of first use of the mark and the date of first use in commerce over which Congress has control (usually interstate commerce).

As applied to the adoption of new trademarks, the requirement of establishing use of a mark prior to applying for its registration is unrealistic since the time interval between clearance and adoption of a trademark and use of commercial quantities varies from several months to several years depending upon the products involved. Typically, before a consumer product is marketed commercially, there is considerable time and effort expended in the developmental effects. After having undertaken the effort and expense of creating and planning the promotion of a new mark, however, the businessman may find that the mark is not registrable because of conflict with another mark or some other reason. These problems led to the drafting and introduction of intent to use legislation.

Canada, in 1954, after careful study, adopted a system permitting applications for registration on the basis of an owner's proposed use. The Canadian system is favorably regarded by businessmen, as are the intention to use systems of many other nations. Approximately one-half of the trademark applications filed today in Canada are based on proposed use, rather than actual use, evidencing the usefulness and acceptability of the system.

Differences Between Previous Intention To Use Legislation and the Treaty

Although similar in terms of their substantive effect, the "intent to use" amendments previously proposed in this country do not satisfy the requirements of the Treaty. There are two basic differences:

(1) The time period under the Treaty during which use may not be required cannot be less than 3 years, counted from the filing date.

Under the "intent to use" bills, the time period was flexible, depending upon the length of time consumed by the examination, i.e. 90 days, counted from the date of allowance of the application by the examiner (a shorter period if the application were opposed). Although entirely dependent upon pendency experience of the Patent and Trademark Office, the period of permitted non-use of most of the applied for marks under those bills would have been in the approximate range of one to two years, counted from the filing date.

Whereas the Treaty permits the "reserving" of a mark for an initial 3 years, more extended "reserving" may be precluded under Article 19(3) and this is done in the proposed implementing legislation. Thus, the 3 year period cannot be extended except for extraordinary reasons. The fact that an application is still pending at the date of expiration of the 3 years may *not* be accepted as a reason for extension. The use requirements after 3 years are the same as under present law.

(2) Under the Treaty, the national *registration* effect of an international registration may not, for the initial three year period, be refused or cancelled on the ground of non-use. However, any country may provide that the right to sue for infringement of the registered mark (even during the three years) is subject to the condition of use, i.e. no right to sue until after continuous use has commenced; and that any remedy may relate only to the period after use has commenced.

Under the "intent to use" bills, an application could be filed, and priority secured, based on intent to use, without actual use, but the *registration* would not issue until a declaration demonstrating actual use had been filed and accepted.

The implementing legislation takes into account the above differences, as the Treaty requires. Also, in all respects, the benefits to applicants from the 3 year use moratorium are accorded to United States residents filing regular national applications in the United States as well as to those applicants filing under the Treaty.

A BILL

To amend the Act entitled "An Act to provide for the registration and protection of trademarks used in com-

merce, to carry out the provisions of international conventions, and for other purposes," approved July 5, 1946, as amended.

Be it enacted by the Senate and the House of Representatives of the United States of America in Congress assembled, that, in order to carry out the provisions of the Trademark Registration Treaty and extend its benefits to citizens and residents of the United States pursuant to the authority of Congress to regulate commerce within its control, section 1 of the Act entitled "An Act to provide for the registration and protection of trademarks used in commerce, to carry out the provisions of international conventions, and for other purposes," approved July 5, 1946 (60 Stat. 427), as amended, is amended to read as follows:

"(a) Any person who is the owner of a trademark which is used or intended to be used in commerce may register that trademark on the principal register hereby established, subject to the conditions and requirements of this Act.

"(b) Application by a person described in section 1(a) to register a trademark on the principal register may be made:

(1) By paying in the Patent and Trademark Office the filing fee and filing in such Office—

(A) A written application, in such form as may be prescribed by the Commissioner, signed by the applicant or by a duly appointed representative of the applicant, specifying the applicant's domicile and citizenship and the particular goods in connection with which the trademark is used or intended to be used in commerce;

(B) A drawing of the trademark;

(C) Except where the declaration under section 1(c) is filed together with the application, a declaration of the applicant's intention to use the trademark in commerce in connection with the goods specified in the application;

and by complying with such rules or regulations, not inconsistent with law, as may be prescribed by the Commissioner; or

(2) By designating the United States in an international registration, or in the recording of any later designation in an international registration, published and notified to the Patent and Trademark Office in conformity with the Trademark Registration Treaty: *Provided,* That—

(A) the person applying was entitled to file international applications, is entitled to own international registrations, and is the Owner of the international registration of the trademark sought to be registered under this Act; and

(B) a declaration of such person's intention to use the trademark in commerce in connection with the goods specified in the international registration is notified to the Patent and Trademark Office in conformity with the said Treaty.

"A person whose international application, or request for the recording of later designation, designating the United States, has been declined by the International Bureau may apply to register the same trademark under paragraph (1) of this subsection. If the application under paragraph (1) is filed in the Patent and Trademark Office prior to the expiration of two months, counted from the date of the notification by the International Bureau of its declining of the corresponding international application or request, and if the Commissioner determines that such declining was not justified, the application shall be treated as if it had been filed on the date which would have been the international registration date or the recording date of the later designation had the declining not taken place.

"(c)(1) The applicant of an application for registration under this Act, or the registrant of a registration issued on the basis of such application, shall file in the Patent and Trademark Office, in such form as may be prescribed by the Commissioner, a declaration stating that the trademark is in use in commerce and that such use commenced on or prior to the date of expiration of three years counted from the filing date of the application, and specifying the date of his first use of the trademark, the date of his first use of the trademark in commerce, those of the particular goods identified in the registration, or, if the registration has not been issued, in the application for registration, in connection with which the trademark is used, and the mode or manner in which the trademark is used in connection with such goods. The declaration shall be signed by the registrant or his duly appointed representative, or, if the registration has not been issued, by the applicant or his duly appointed representative, and it shall be accompanied by such number of specimens or facsimiles of the trademark as actually used as may be prescribed by the Commissioner. Where the declaration concerns an application filed under, or registration issued pursuant to, section 1(b)(2), it may, in such form as may be prescribed by the Commissioner or in the form prescribed by the Trademark Registration Treaty, be filed with the International Bureau, with the same effect as if it had been filed in the Patent and Trademark Office on the date on which it was received by the International Bureau.

(2) The declaration under paragraph (1) of this subsection may be filed together with the application to which it pertains, or later: *Provided,* That unless such declaration has been filed prior to the expiration of four years, counted from the filing date, the Commissioner shall cancel the registration, if issued, or refuse the application for registration, if pending. If the declaration is accepted in respect of fewer than all of the goods stated in the registration or identified in the application, the application or registration shall be limited by the Commissioner to those of the particular goods specified in the declaration in connection with which the mark is in use in commerce.

(3) If an application for registration is pending after the expiration of the three-year period referred to in paragraph (1) of this subsection, or if a registration is relied upon in an opposition or cancellation proceeding under this Act which was filed, or which is pending, after the expiration of such period, the Commissioner may require that the declaration under this subsection in respect of such application or registration be filed within such earlier period as he may prescribe: *Provided,* That such earlier period shall not expire earlier than 2 months, counted from the date of a notice mailed to the applicant or registrant.

(4) If a person who applied for registration of a trademark under this Act, or any successor, assignee or related company of such applicant, shall subsequently apply for registration under this Act of the same or a substantially equivalent trademark on or prior to the date of expiration of five years from the filing date of the said earlier application in respect of all or fewer than all of the goods recited in the said earlier application, the three-year period referred to in paragraph (1) of this subsection shall, in respect of those of the goods which are the same, be counted from the filing date of the said earlier application, or if there were more than one such earlier application, from the filing date of the earliest of them: *Provided,* That this paragraph shall not be applicable if a declaration of use

conforming to the requirements of this subsection is filed together with the said subsequently filed application.

(5) Upon a satisfactory showing by the applicant or registrant that his failure to commence use of the mark in commerce on or prior to the date of expiration of the three-year period referred to in paragraph (1) of this subsection was due to extraordinary circumstances which excuse such failure and was not due to any intention to abandon the mark, the Commissioner may extend the date of expiration of the said period and of the time limit for filing the declaration under this subsection: *Provided,* That the said expiration dates may not be extended for the reason that the application for registration was pending after the date of expiration of the said three-year period.

(6) The Commissioner shall notify the applicant or registrant who files the above prescribed declaration of his acceptance or refusal thereof and, if a refusal, the reasons therefor.

"(d) In any application in respect of which the declaration under section 1(c) has been filed, the applicant may claim concurrent use. If concurrent use is claimed, the applicant shall state exceptions to his claim of exclusive use, in which he shall specify, to the extent of his knowledge, any concurrent use by others, the goods in connection with which and the areas in which each concurrent use exists, the periods of each use, and the goods and area for which the applicant desires registration.

"(e) If the applicant is not domiciled in the United States he shall designate by a written document filed in the Patent and Trademark Office the name and address of some person resident in the United States on whom may be served notices or process in proceedings affecting the trademark. Such notices or process may be served upon the person so designated by leaving with him or mailing to him a copy thereof at the address specified in the last designation so filed. Unless filed with the application, the document designating such person shall be filed on or prior to the date on which the applicant, or the registrant of any registration issued on the basis of such application, replies to any communication by the examiner, or otherwise institutes or defends any proceeding under this Act, relating to such application or registration. Until such person has been designated, or if the person so designated cannot be found at the address given in the last designation, such notices or process may be served upon the Commissioner."

SEC. 2 The first sentence of section 3 of such Act is amended by striking out "used in commerce".

SEC. 3 The first sentence of section 4 of such Act is amended by striking out "used in commerce" and by inserting, following "exercising", the words "or intending to exercise".

SEC. 4 Section 5 of such Act is amended by inserting, following "used" (first occurrence), the words ", or is intended to be used,"; and by inserting, following "use" (both occurrences), the words "or intention to use".

SEC. 5(a) The second sentence of section 7(a) of such Act is amended by inserting, following "date" (third occurrence), the words "of issue"; by striking out "date on which the application for registration was received in the Patent and Trademark Office" and inserting in lieu thereof the words "filing date"; and by changing the period at the end of the sentence to a colon and adding the following proviso:

"*Provided,* That if the declaration under section 1(c) has not been filed, this fact shall be indicated in lieu of the dates of first use of the mark."

(b) A new sentence is added to section 7(a) of such Act reading as follows:

"The Commissioner shall cause a notice concerning the issuance of the registration to be published in the Official Gazette of the Patent and Trademark Office."

(c) Section 7(b) of such Act is amended to read as follows:

"Subject to any conditions and limitations stated therein, a certificate of registration of a mark upon the principal register provided by this Act shall be prima facie evidence of the validity of the registration, of the registrant's ownership of the mark, and of the right of the registrant to prevent registration under this Act by any other person, except a lawful concurrent user, of the mark either in the identical form as reproduced in the registration, or in such near resemblance thereto as to be likely, when applied to the goods or services of such other person, to cause confusion or to cause mistake, or to deceive."

(d) Section 7(d) of such Act is amended by inserting, preceding the first sentence of such subsection, "(1)" and by adding, at the end thereof, the following new paragraphs:

"(2) The registrant of any registration under this Act may limit the goods and/or services specified in his registration by filing an application, in such form as may be prescribed by the Commissioner, for the recording of such limitation or, in the case of a registration issued on the basis of an application under section 1(b)(2), or renewed pursuant to section 9(b)(2), by filing at the International Bureau a request for the recording of a limitation, in respect of the United States, of the goods and/or services of the international registration on the basis of which such registration was issued. The Commissioner shall refuse to record any limitation requested by the registrant if its effect would be to enlarge the scope of the goods and/or services beyond that of the goods and/or services specified in the registration. The recording by the International Bureau of a limitation of the goods and/or services, in respect of the United States, of an international registration shall, unless refused by the Commissioner, have the same effect as if such limitation had been entered in the records of the Patent and Trademark Office on the same date of such recording."

"(3) Where the Commissioner has limited the goods and/or services of any registration pursuant to the provisions of paragraph (2) of this subsection, or sections 1(c)(2), 8(a)(2), or 9(c)(2) of this Act, appropriate entry of such limitation shall be made in the records of the Patent and Trademark Office and, if requested by the registrant, upon the certificate of registration or, if such copy is lost or destroyed, upon a certified copy thereof."

(e) Section 7 of such Act is amended by adding, after subsection 7(g), the following new subsection:

"(h)(1) Appropriate entry shall be made in the records of the Patent and Trademark Office of any recording notified to it by the International Bureau in respect of a registration issued on the basis of an application under section 1(b)(2), or renewed pursuant to section 9(b)(2), unless the effect of such recording has been refused in conformity with the provisions of this Act or of the Trademark Registration Treaty.

(2) The Commissioner shall notify the International Bureau as provided in the Trademark Registration Treaty before making any entry, other than as specified in paragraph (1) of this subsection, in the records of the Patent and Trademark Office in respect of a registration issued on the basis of an application

under section 1(b)(2), or renewed pursuant to section 9(b)(2), and the entry in such records shall not be made until the corresponding entry has been annotated and published by the International Bureau as provided in the said Treaty."

SEC. 6 Section 8(a) of such Act is amended to read as follows:

"(1) The initial term of a registration under this Act shall be 10 years counted from the filing date:

Provided, That the registration of any mark under the provisions of this Act shall be cancelled by the Commissioner at the end of 6 years counted from its date of issue, unless, within 1 year next preceding the expiration of such 6 year period, the registrant shall file in the Patent and Trademark Office, in such form as may be prescribed by the Commissioner, an affidavit or declaration showing that the mark is still in use in commerce. Special notice of the requirement for such affidavit or declaration shall be attached to each certificate of registration. Where the affidavit or declaration concerns a registration issued pursuant to section 1(b)(2), it may, in the form prescribed herein, or in the form prescribed by the Trademark Registration Treaty, be filed with the International Bureau, with the same effect as if it had been filed in the Patent and Trademark Office on the same date as the date on which it was received by the International Bureau.

(2) If the affidavit or declaration of use under paragraph (1) of this subsection is accepted in respect of fewer than all of the goods and/or services stated in the registration, the registration shall be limited by the Commissioner to those of the particular goods and/or services specified in the affidavit or declaration in connection with which the mark is still in use in commerce.

(3) Upon a satisfactory showing by the registrant that his nonuse of the mark in commerce is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark, the Commissioner may extend the time for filing the affidavit or declaration under this section."

SEC. 7 Section 9 of such Act is amended to read as follows:

"(a) The owner of a mark which is still in use in commerce may renew his registration of that mark for periods of ten years from the end of each expiring period of the registration, subject to the conditions and requirements of this Act.

"(b) Renewal of a registration by a person described in section 9(a) may be effected:

(1) By paying in the Patent and Trademark Office the prescribed fee and filing in such Office—

(A) within the six months next preceding the date of expiration of the period for which the registration was issued or renewed, an application for renewal; or

(B) prior to the expiration of six months counted from the date of expiration of the period for which the registration was issued or renewed, an application for late renewal, on payment of the additional fee herein prescribed;

and by complying with such rules or regulations, not inconsistent with law, as may be prescribed by the Commissioner; or

(2) By the renewal of an international registration in respect of which the United States is a designated State, published and notified to the Patent and Trademark Office in conformity with the Trademark Registration Treaty, *Provided:* That the person applying is entitled to own international registrations and is the Owner of the international registration of the mark sought to be renewed under this Act.

If the Commissioner refuses an application for renewal of a registration filed under paragraph (1), he shall notify the registrant of his refusal and the reasons therefor. The provisions of section 1(e) shall be applicable to any person not domiciled in the United States who applies for or effects the renewal of a registration under this Act.

"(c)(1) The registrant of a registration renewed under this Act shall file in the Patent and Trademark Office, in such form as may be prescribed by the Commissioner, a declaration stating that the mark is still in use in commerce, and specifying those of the particular goods and/or services identified in the registration on or in connection with which the mark is so used. The declaration shall be signed by the registrant or by his duly appointed representative, and shall be accompanied by a specimen or facsimile showing current use of the mark. Where the renewal is effected pursuant to section 9(b)(2), the declaration may, in the form prescribed herein, or in the form prescribed by the Trademark Registration Treaty, be filed with the International Bureau, with the same effect as if it had been filed in the Patent and Trademark Office on the date on which it was received by the International Bureau.

(2) The declaration under paragraph (1) of this subsection may be filed together with the application for renewal under section 9(b)(1), or, in the case of a renewal effected pursuant to section 9(b)(2), with the demand for renewal of the corresponding international registration filed with the International Bureau, or later: *Provided,* That unless such declaration has been filed prior to the expiration of six months, counted from the starting date of the term of renewal, the Commissioner shall cancel the registration. If the declaration is accepted in respect of fewer than all of the goods and/or services stated in the registration, the registration shall be limited by the Commissioner to those of the particular goods specified in the declaration in connection with which the mark is still in use in commerce.

(3) Upon a satisfactory showing by the registrant that his nonuse of the mark in commerce is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark, the Commissioner may extend the time for filing the declaration under this section.

(4) The Commissioner shall notify the registrant who files the above prescribed declaration of his acceptance or refusal thereof and, if a refusal, the reasons therefor."

SEC. 8(a) Section 10 of such Act is amended by inserting, preceding the first sentence of such section, "(a)(1)", by striking out "(d)" in the last sentence and inserting in lieu thereof "(e)", and by adding at the end of such section the following new paragraphs:

"(2) A change in the ownership of a registration or application for registration under this Act may be recorded in the Patent and Trademark Office in such form as may be prescribed by the Commissioner, or, in the case of an application filed or registration issued pursuant to section 1(b)(2), or renewed pursuant to section 9(b)(2), by recording the change in Ownership, in respect of the United States, of the international registration on the basis of which such application was filed or such registration was issued. The recording by the International Bureau of a change in the Ownership, in respect of the United States, of an international registration shall, if valid,

have the same effect as if such change had been entered in the records of the Patent and Trademark Office on the same date as the date of such international recording.

"(3) The recording of a change in ownership pursuant to paragraph (2) which is the result of an assignment of the registered or applied for mark shall, as of the date of such recording, be accorded the same effects as those which are accorded to the recording of such assignment: *Provided,* That within three months from the date of notice of such recording, mailed to the person who applied therefor, or, where the recording is effected by the International Bureau, from the date of publication of such international recording, instruments of assignment conforming to the requirements of paragraph (1) have been recorded in the Patent and Trademark Office.

"(4) Any person, not entitled to file international applications, who has, nevertheless, become the owner of an application filed or registration issued pursuant to section 1(b)(2), or renewed pursuant to section 9(b)(2), other than as a result of a contract between him and the previous applicant or registrant, may file an application for registration of the same mark under section 1(b)(1). If the application under section 1(b)(1) is filed by such person in the Patent and Trademark Office within two years from the said change in ownership and prior to six months after the expiration of the initial term, or of the then running term of renewal, of the international registration on which such application or registration is based, it shall, in respect of those of the goods and/or services which are the same, be treated as if it had been filed on the same date as the date on which the designation of the United States in such corresponding international registration took effect: *Provided,* That such application under section 1(b)(1) conforms to all of the requirements of this Act."

(b) Section 10 of such Act is amended by adding the following subsections:

"(b) Instruments evidencing changes in the name of the applicant or registrant may be recorded in the Patent and Trademark Office, in such form as may be prescribed by the Commissioner, or, in the case of a registration issued on the basis of an application filed under section 1(b)(2), or renewed pursuant to section 9(b)(2), by recording the change in the name of the Owner of the international registration on the basis of which such registration was issued. The recording by the International Bureau of a change in the name of the Owner of an international registration, in which the United States is a designated State, shall, if valid, have the same effect as if it had been entered in the records of the Patent and Trademark Office on the same date as the date of such recording.

"(c) Where at any time, as a result of a final decision in any proceeding under this Act, it is determined that a recording made under this section is void or that such recording was made contrary to the requirements of the Act, the Commissioner shall, upon request of any interested party, cause an appropriate correction to be entered in the records of the Patent and Trademark Office. If such recording was effected on the basis of a recording in respect of an international registration, the Commissioner shall, if appropriate, deny the effect of such international recording and notify the International Bureau accordingly, as prescribed in the Trademark Registration Treaty."

SEC. 9 Section 12(a) of such Act is amended to read as follows:

"Upon the filing of an application for registration, the Commissioner shall refer the application to the examiner in charge of the registration of marks, who shall cause an examination to be made. Unless the application has been previously withdrawn or abandoned, the mark shall be published in the OFFICIAL GAZETTE of the Patent and Trademark Office at such time as the Commissioner shall prescribe, not later than 12 months, counted from the filing date of the application. In the case of an applicant claiming concurrent use, or in the case of an application to be placed in an interference as provided for in section 16 of this Act, the mark may be published subject to the determination of the rights of the parties to such proceedings."

SEC. 10 Section 12(b) of such Act is amended by striking out "6" in two places and inserting, in lieu thereof "3" and by adding at the end thereof:

"Except for the failure of an applicant to comply with the requirements of section 1(c), no mark shall be refused registration for a reason which has not been indicated in a communication given or mailed to the applicant on or prior to 12 months, counted from the filing date: *Provided,* That this limitation shall not apply to any refusal determined by the Trademark Trial and Appeal Board or by a court."

SEC. 11 The second sentence of section 13 of such Act is amended by changing the period at the end of this sentence to a colon and adding a proviso and a new third sentence reading as follows:

"Provided, That such time shall in no event be extended to a date which is later than 14 months, counted from the filing date of the application for registration in respect of which the extension of time for filing opposition is requested. An opposition may be filed by a duly authorized attorney of the opposer."

SEC. 12 Section 14 of such Act is amended by inserting, following "person" the words, "or by a duly authorized attorney of any person"; by inserting, following "date" in clause (a), the words "of issue", and by inserting, following "thereunder", in clause (c), the following words:

"or, in the case of a registration issued on the basis of an application under section 1(b)(2), or renewed pursuant to section 9(b)(2), on the ground that the registrant was not entitled to own international registrations,".

SEC. 13 The first sentence of section 15 of such Act is amended by inserting, following the third occurrence of "date", the words "of issue".

SEC. 14 The first sentence of section 16 of such Act is amended by inserting, following "may" the words ", prior to the publication under section 12(a) of such mark,".

SEC. 15 Section 17 of such Act is amended by inserting, between the first and second sentences thereof:

"Where an interference, opposition to registration or concurrent user proceeding concerns an application for registration under this Act of a mark, the entitlement to registration of which has not been finally determined by the examiner in charge of the registration of marks or, as a result of an appeal from a final refusal of the examiner, by the Trademark Trial and Appeal Board or a court, the Commissioner may, with notice to all parties, defer the commencement of such proceeding until such final determination has been made."

SEC. 16 The first sentence of paragraph (1) of section 21(a) of such Act is amended by inserting, following "affidavit", the words "or declaration"; and by striking out "section 8" and inserting in lieu thereof "section 8, 1(c), or 9(c)".

SEC. 17 Section 22 of such Act is amended by inserting, at the beginning of the sentence, "Issuance of a" and by changing the "R" in "Registration" to "r".

SEC. 18 Section 23 of such Act is amended by inserting, following "commerce" in the second sentence of such section, ", or are intended to be used in commerce,"; by striking out in the second sentence of such section "for the year preceding the filing of the application"; by inserting between the second and third sentences of such section: "An application for the registration of a mark shall be treated as an application under this section only if the application or, in the case of an application pursuant to section 1(b)(2), if the international registration or recording of later designation which is the basis for such application, contains an indication to this effect."; and by striking out in its entirety the last sentence of such section.

SEC. 19(a) The second sentence of section 24 of such Act is amended by inserting, preceding "may," the words ", or his duly authorized attorney," and by striking out the word "verified".

(b) The fourth sentence of section 24 of such Act is amended by inserting, following "used", the words ", following the date of expiration of the period referred to in section 1(c)(1),".

SEC. 20 The second sentence of section 30 of such Act is amended to read as follows:

"When the goods and/or services specified in an application fall within a plurality of classes, a fee equalling the sum of the fees for filing an application in each class shall be paid, and the Commissioner may issue a single certificate of registration for such mark."

SEC. 21(a) Subsection (a) of section 31 of such Act is amended by striking out paragraph (3) of such subsection, by appropriately renumbering the remaining paragraphs; and by inserting, following "mark" in newly renumbered clause (6) (old paragraph (7)), ", change in the name of the registrant,".

(b) Section 31 of such Act is amended by adding, after subsection 31(c), the following new subsection:

"(d) The fees specified in paragraphs (1) and (2) of subsection (a) shall, in the case of applications pursuant to section 1(b)(2) and renewals pursuant to section 9(b)(2), be deemed to be substituted for, respectively, by the individual State fees and the individual State renewal fees applicable to designations of and renewals concerning the United States pursuant to the Trademark Registration Treaty. The Commissioner shall communicate to the International Bureau the amounts of such individual State fee and individual State renewal fee and such amounts shall be the same, respectively, as the amounts of the fees specified in paragraphs (1) and (2) of subsection (a)."

SEC. 22 Section 32(1) of such Act is amended by adding at the end of such section the following sentence:

"No action under this section may be started by the registrant of a registration issued under this Act until the declaration under section 1(c) in respect of the mark which is the subject of such registration has been filed in the Patent and Trademark Office and accepted by the Commissioner."

SEC. 23(a) Section 33(a) of such Act is amended by inserting following "registration" (second occurrence), the words ", and in respect of which the mark is stated to be in use in commerce in the registration, or in the declaration under section 1(c) which has been filed in the Patent and Trademark Office and accepted by the Commissioner,"

(b) Paragraph (5) of section 33(b) of such Act is amended by inserting, preceding "registration" the words "the date of issue of the".

(c) Section 33 of such Act is amended by adding, after subsection 33(b), a new subsection reading as follows:

"(c) For the purpose of determining priority of rights in any proceeding under this Act, an application for registration of a mark which has not been withdrawn or abandoned or a registration issued on the basis of such application, shall, from and after its filing date, be accorded the same effect as if the applicant, or the registrant, had commenced use of the mark in commerce on the said filing date, without derogation, however, of any earlier priority based on use of the mark commenced earlier than the said filing date or of any right of priority to which the applicant or registrant may be entitled pursuant to section 44(d) of this Act."

SEC. 24 Section 35 of such Act is amended by adding at the end of such section the following sentence:

"Any remedy under this section shall relate only to the period after the registrant commenced the continuing use of the mark in commerce."

SEC. 25 Section 44(a) of such Act is amended by inserting, preceding the first sentence of such subsection, "(1)" and by adding, at the end thereof, the following new paragraphs:

"(2) The Commissioner shall keep a register of international registrations designating the United States which have been published and notified to the Patent and Trademark Office in conformity with the Trademark Registration Treaty, including renewals thereof and recordings related thereto, and shall be authorized to accord and refuse effects, communicate notifications, make attestations, decide petitions, determine the amounts of and receive payments of fees, and perform all other acts prescribed by the said Treaty, subject to the requirements thereof.

"(3) Where the time limit for a notification to the International Bureau prescribed by the Trademark Registration Treaty is stated in terms of the date of receipt of such notification by the International Bureau, such notification shall be transmitted by Registered Mail no later than 14 days prior to the expiration of the time limit and, except where an agency of the said Bureau, established pursuant to the said Treaty, is operating within the United States, shall be transmitted to that bureau via Air Mail.

"(4) A mark subject of an application under section 1(b)(2) in respect of which no notification of refusal or possible refusal was received by the International Bureau within the time limit fixed in Article 12(2)(a)(i) of the Trademark Registration Treaty shall be automatically entitled to registration under this Act on the same register as the one for which such application was made. Upon request by the applicant of such an application and unless the registration has been previously issued, the Commissioner shall issue the registration to which such applicant is entitled under this paragraph and the date of issue of such registration shall be the date of the OFFICIAL GAZETTE next preceding the date of expiration of the said time limit. Registration of a mark under the provisions of this paragraph shall be without prejudice to the right of any person to petition to cancel such registration under section 14 of this Act for any reason, including one which was referred to in a refusal made pursuant to section 12(b) or in an opposition filed pursuant to section 13, the notification of which was not received by the International Bureau or which was not received by such Bureau within the said time limit. If a registration is

issued pursuant to this paragraph in respect of a mark, the registration of which had been opposed in a timely filed opposition, the Commissioner shall notify the opposer in such opposition and shall, upon request of such opposer received within 30 days from the date of such notice, direct the Trademark Trial and Appeal Board to determine and decide the rights of registration as if the opposition to registration had been filed as an application to cancel the said registration on the date of issue of such registration.

"(5) Failure by the applicant of an international application or by the Owner of an international registration to act within prescribed time limits in connection with requirements pertaining to an international application, international registration or later designation designating the United States, or to any recording related thereto, may be excused upon a showing satisfactory to the Commissioner of unavoidable delay, to the extent not precluded by the Trademark Registration Treaty or by this Act."

SEC. 26 Section 44(c) of such Act is amended by striking out the first sentence of such section; and by striking out the heading, preceding the second sentence, "Country of origin defined."

SEC. 27 Section 44(d) of such Act is amended to read as follows:

"An application for registration of a mark under sections 1, 2, 3, 4 or 23 of this Act filed by a person described in paragraph (b) of this section who has previously duly filed an application for registration of the same mark in one of the countries described in paragraph (b), or a regular international application in respect of the same mark designating at least one country other than the United States, shall be accorded the same force and effect as would be accorded to the same application if filed under this Act on the same date on which such application was first filed in such foreign country, or on which such international application was first filed with the International Bureau: *Provided,* That—

(1) The application under this Act is filed within 6 months from the date on which the application was first filed in the foreign country or on which the international application was first filed with the International Bureau;

(2) The rights acquired by third parties before the date of the filing of the first application in the foreign country or of the first international application shall in no way be affected by a registration obtained on an application filed under this subsection (d):

(3) Nothing in this subsection (d) shall entitle the owner of a registration granted under this section to sue for acts committed prior to the date on which such registrant has commenced the continuing use of the mark in commerce.

In like manner and subject to the same conditions and requirements, the right provided in this section may be based upon a subsequent regularly filed foreign application or subsequent regular international application, instead of the first filed foreign application or international application: *Provided,* That any foreign application or international application filed prior to such subsequent application or international application has been withdrawn, abandoned, or otherwise disposed of, without having been laid open to public inspection and without leaving any rights outstanding, and has not served, nor thereafter shall serve, as a basis for claiming a right of priority."

SEC. 28(a) The paragraphs headed "Trademark," "Service Mark," "Certification Mark," "Collective Mark" and "Intent of Act" in section 45 of such Act are amended by inserting, following each occurrence of "used", the words "or intended to be used".

(b) Clause (a) of the paragraph in section 45 of such Act headed "Abandonment of Mark" is amended to read as follows:

"(a) when its use has not commenced and there is no intent to commence use or when its use has been discontinued with intent not to resume. Lack of intent to commence or intent not to resume may be inferred from the circumstances. If use of a mark has been discontinued, its nonuse for two consecutive years shall be prima facie abandonment."

(c) Section 45 of such Act is amended by adding the following paragraphs:

"Filing date. The filing date of an application for registration under section 1(b)(1) shall be the date on which all of the elements prescribed by the Commissioner as minimum elements for according a filing date have been received in the Patent and Trademark Office. The filing date of an application for registration under section 1(b)(2) shall be the same date as the international registration date of the international registration or, if applicable, the recording date of the later designation, on the basis of which such application is filed."

"Date of issue. The date of issue of a registration under this Act is the date of the issue of the OFFICIAL GAZETTE of the Patent and Trademark Office in which the notice concerning the issuance of the registration appears."

"Trademark Registration Treaty. The term "Trademark Registration Treaty" means the Treaty so entitled, done at Vienna, Austria, on June 12, 1973, including the Regulations under the said Treaty."

"International application, international registration, request for the recording of later designation, recording of later designation, International Bureau, regular international application, individual State fee, individual State renewal fee. The terms "international application", "international registration", "request for the recording of later designation", "recording of later designation", "International Bureau", "regular international application", "individual State fee" and "individual State renewal fee" are to be taken in the sense indicated by the Trademark Registration Treaty."

"Owner, Ownership. The terms "Owner" and "Ownership" are to be taken in the sense indicated by the Trademark Registration Treaty where they appear in this Act in capitalized form."

"Owner of a trademark. The term "owner of a trademark" means a person who is using, or who has an intention to use, a trademark in commerce: *Provided,* That no other person, except a lawful concurrent user, has the right to use, and is using or has previously declared, in an application filed under this Act which has not been withdrawn or abandoned, his intention to use, such mark in commerce either in the identical form thereof or in such near resemblance thereto as to be likely, when applied to the goods of such other person, to cause confusion, or to cause mistake, or to deceive."

SEC. 29(a) This Act shall come into force on the same date as the entry into force of the Trademark Registration Treaty with respect to the United States. It shall apply to applications for registration of marks filed in the Patent and Trademark Office on or after such date, even though entitled to an earlier effective filing date, and to registrations issued on the basis of such applications; to international applications and later desig-

nations designating the United States filed with the International Bureau on or after such date, even though entitled to an earlier effective filing date, and to international registrations accorded effects in the United States on the basis of such international applications and later designations; and to proceedings under the Trademark Act of 1946, as amended, commenced on or after such date.

(b) Except as otherwise hereafter provided, applications for registration of marks on file in the Patent and Trademark Office on the date this Act comes into force, registrations issued on the basis of such applications, and proceedings under the Trademark Act of 1946, as amended, which are pending on such date, shall be governed by the provisions of the Trademark Act of 1946, as amended, in effect immediately prior to such date.

(c) Except as otherwise provided hereafter in this section, all registrations under the Trademark Act of 1946, as amended, or under the previous Acts specified in section 46(b) of such Act, existing on the date this Act comes into force shall be governed by the Trademark Act of 1946, as amended, in effect immediately prior to such date.

(d) The provisions of section 9 of the Trademark Act of 1946, as amended, as amended by this Act, shall apply to all registrations under such Act and under the previous Acts specified in section 46(b), whether issued or applied for before, on, or after the date this Act comes into force: *Provided*, that the amendments to such section by this Act shall not apply to the renewal of any registration for any period which started on a date which is earlier than six months after such date.

(e) The amendment by this Act, of the Trademark Act of 1946, as amended, shall not affect any rights or liabilities existing under such Act in effect immediately prior to the date this Act comes into force.

SECTIONAL ANALYSIS

SECTION 1 of the bill amends section 1 of the Trademark Act of 1946, as amended (hereinafter referred to as Trademark Act) [1] in a number of respects. The preamble makes it clear that the commerce clause as well as the treaty power is invoked to support the amendments. Section 1 of the amended Trademark Act is divided into five subsections, each of which is separately discussed below:

Section 1(a) *Entitlement to registration of a trademark.* Entitlement to registration is changed from present law in one fundamental respect. This is that intention to use, as well as actual use of, a trademark is a valid basis for ownership and registration. The other conditions are essentially the same as under present law.

The applicant must be a "person", as defined in section 45. The definition of "person" has not been changed.

As under the present statute, the applicant must be the "owner" of the trademark sought to be registered. The concept of ownership is modified as necessary to be consistent with the new alternative basis of rights. Also, rather than being part of the verified statement, the definition of "owner of a trademark" is in section 45.

The term "owner" is defined, as under present law, in respect of the absence of a superior right in any other person. What is new is that a claim of ownership is defeated not only by the superior right of a prior *user* of the same or a similar mark but also by the superior right of one who has a prior *intention to use* such a mark. However, the latter right can defeat the claim of ownership *only* if the intention to use has been previously declared in an application filed under the Act which has not been withdrawn or abandoned. Accordingly, while a person acquires (absent a superior right) an ownership right by reason of his intention to use a trademark, the right in that case is inchoate and is accorded no protection under the statute and no priority until it has been fixed in an application filed under the Act in which the intention to use is declared. Thus, filing the application is critical to a claim of ownership by intention to use and except, of course, where the Paris Convention "right of priority" (i.e. section 44(d)) is invoked, the filing date is the earliest date on which such a person can rely in a priority contest. (See SECTION 23(c))

Finally, the use or intended use must be in commerce. The definition of "commerce" is not changed. The outside parameters of "intended use in commerce" are left to interpretation just as has been the case with "use in commerce" under the present statute, and the principles that would be applied in such interpretation are essentially the same.

Section 1(b) *Procedure for applying to register a trademark.* Under the amended Act, there are two basic procedures for securing the registration of a trademark, i.e. by filing an application in the Patent and Trademark Office (section 1(b)(1)) and by designating the United States in an international registration pursuant to the Trademark Registration Treaty [2] (section 1(b)(2)). Except for the place where the application is filed and the fee is paid, the substantive requirements applicable to the alternative procedures are essentially the same.

Section 1(b)(1) *Domestic procedure.* In order to achieve harmonization of domestic and international procedures, the following changes are made in the national application procedures.

1. The application may be signed by a representative, duly appointed by the applicant, as an alternative to signing by the applicant himself. The same benefit is provided to applicants filing under the Trademark Registration Treaty (Article 26).

2. Consistent with the requirements of the Trademark Registration Treaty and modern practice in regard to the filing of statements with federal agencies the verification of ownership requirement has been eliminated.

Of course, the criminal provisions of 18 U.S.C. 1001 would remain applicable to a statement made in a trademark application irrespective of whether such statement is verified.

3. The applicant need not allege use of the mark in his application. The Trademark Registration Treaty prohibits such a requirement (Article 19(3)(a)) for the owners of international registrations; consequently, the same benefit is accorded to persons filing regular national applications. Substituted for this requirement is the declaration of intention to use the mark in commerce, which *is* permitted by the Treaty (Article 19(4)). Consistent with this change, specimens or facsimiles of the mark as actually used need not be submitted with the application.

It should be noted that required allegations and exhibits relating to actual use according to the present statute are

[1] Public Law 489, 79th Congress, approved July 5, 1946; 60 Stat. 427. Amendments have been effected by the following public laws.
P.L. 710, 81st Cong., 64 Stat. 459, 8–17–50.
P.L. 593, 82nd Cong., 66 Stat. 792, 7–19–52.
P.L. 609, 85th Cong., 72 Stat. 540, 8–8–58.
P.L. 333, 87th Cong., 75 Stat. 748, 10–3–61.
P.L. 772, 87th Cong., 76 Stat. 769, 10–9–62.
P.L. 89–83, 89th Cong., 79 Stat. 260, 7–24–65.
P.L. 93–596, 93rd Cong., 88 Stat. 1949, 1–2–75.
P.L. 93–600, 93rd Cong., 88 Stat. 1955, 1–2–75.

[2] Done at Vienna, Austria, June 12, 1973. This is the Treaty which was transmitted by the President to the Senate for advice and consent to ratification on September 3, 1975. *Congressional Record* 9/3/75, S. 15139.

retained in section 1(c). It should also be noted here that the applicant *may* file the section 1(c) declaration together with his application (section 1(c)(2)), if the mark is already in use in commerce. In such case, the declaration of intention to use is obviously superfluous and need not be made.

Section 1(b)(2) *International procedure.*

This paragraph states the requirements which must be satisfied in order to secure the effect of a United States application, i.e. the effect required by the Trademark Registration Treaty (Article 11(1)).

The provisions of Article 19(4) of the Treaty, requiring a declaration of intention to use, are also implemented, corresponding to the same requirement in section 1(b)(1)(C) for domestic applicants.

Finally, a special requirement as to entitlement of a foreign applicant to use the Trademark Registration Treaty (Article 4) has been added since the International Bureau will only examine this question formally, leaving it to the designated States to examine it as to substance. Thus, non-entitlement of a foreign applicant to use the Treaty procedure is a ground for refusal (Article 12(1)(ii)) or cancellation (Article 13(1)(ii)) in addititon to the grounds applicable under the national law.

The final two sections of section 1(b) implement part of Article 9 of the Treaty whereunder the improper declining of an international application or later designation request by the International Bureau can be rectified by filing a regular domestic application within 2 months from the notice of the declining.

Section 1(c) *Declaration of use.*

Section 1(c) calls for a declaration of use showing that use of the mark commenced on or prior to the date of expiration of three years, counted from the filing date. Paragraph (1) requires the declaration to contain essentially the same information as that required by present section 1.

Paragraph (2) prescribes a time limit of four years, counted from the filing date, within which the declaration may be filed, and indicates the consequences of failure to file an acceptable declaration.

Paragraph (3) authorizes the Commissioner to require the earlier filing of a declaration when important relative to an issue in any Office proceeding, provided that the three-year period has expired.

Paragraph (4) prevents abuse of the intention to use provisions by a person filing successive applications for the same, or a substantially equivalent, mark by providing that, unless there is a gap of at least two years between the expiration of the nonuse moratorium of the earlier case and the date of filing of the later case, the three-year period in the later case is measured from the filing date of the earlier case. Any subsequent application which is accompanied by a declaration of use is excluded from the special provisions.

Paragraph (5) provides for an extension of the time limits when due to extraordinary circumstances nonuse is excusable. The proviso expressly states, however, that the mere pendency of the application for registration as of the expiration of the three-year period shall not justify an extension, making it clear that Article 19(3)(b) of the Trademark Registration Treaty does not apply in the United States.

Paragraph (6) requires the Commissioner to give notice regarding acceptance or refusal of a declaration.

Section 1(d) *Special requirement for concurrent use applications.*

This provision, unchanged from present law, is placed in a separate subsection because its applicability is limited to applications wherein the section 1(c) declaration of use has been filed.

Section 1(e) *Special requirement for applicants not domiciled in United States.*

This subsection requires all applicants not domiciled in the United States to designate an agent for service on or prior to the institution or defense of a proceeding under this Act. Before a local agent for service has been designated, service may be made upon the Commissioner.

SECTIONS 2 and 3 of the bill amend sections 3 and 4 of the Trademark Act so that service marks and collective and certification marks may be registered based on either use or intention to use.

SECTION 4 of the bill amends section 5 of the Trademark Act to provide that the intended use by a related company inures to the benefit of the registrant or applicant.

SECTION 5(a) of the bill amends section 7(a) of the Trademark Act to take into account the fact that registrations issued on the basis of intent applications would not, if the declaration of use has not been filed, contain any data concerning use of the mark. In such cases, the fact that the declaration has not been filed would be indicated in the registration in lieu of the indications as to use. Also, the term "date of the registration" has been deleted, the significant dates under the amended statute being the "filing date" and the "date of issue."

SECTION 5(b) amends section 7(a) by requiring a notice of registration to be published in the OFFICIAL GAZETTE in support of the definition of "date of issue" in section 45.

SECTION 5(c) amends section 7(b) of the Trademark Act by deleting the presumption of the registrant's exclusive right to use the registered mark in commerce on the goods specified in the registration. One reason is that this presumption in the present statute is repeated in section 33(a).

The other reason is that this presumption, as it pertains to infringement actions, must be limited to be consistent with the limitation on the right even to file an infringement action prior to the commencement of use (see SECTION 23(a)).

Deletion of the "exclusive right to use" presumption from section 7(b) leaves a gap in the statute, however, the bringing of Patent and Trademark Office proceedings, i.e. oppositions and cancellations is not subject to the above mentioned limitation. The exclusive right to use presumption has served in such proceedings as the basis of the ruling that a registrant is entitled to rely solely upon his registration on the principal register as prima facie evidence of his right to exclude any other person from securing a registration under the Act of a confusing mark. Therefore, a presumption as to this right has been added.

SECTION 5(d) of the bill amends section 7(d) by adding two new paragraphs which provided domestic and international procedures, consistent with present law and with the Treaty, for amending a registration in respect of the specification of goods and/or services.

SECTION 5(e) of the bill amends section 7 by adding a new subsection, section 7(h), providing for appropriate notification, consistent with Article 20 of the Treaty, with respect to entries concerning registration based on international registrations.

SECTION 6 of the bill amends section 8(a) of the Trademark Act by changing the term of a registration from 20 to 10 years and the date from which the terms is measured from the registration date to the filing date. These changes correspond the term of domestic registrations to that of registrations secured under the Trademark Reg-

istration Treaty. The shorter term also facilitates the clearing from the register of unused marks.

The section is also amended to require that the use declared in the affidavit or declaration set forth in the proviso, i.e. the present section 8 affidavit, be use "in commerce".

Finally, the section is amended to permit, consistent with the requirement in the Treaty (Article 19(3)(d)), that such affidavit or declaration requirements be capable of being fulfilled in the case of an international registration by filing with the International Bureau.

SECTION 7 of the bill amends section 9 of the Trademark Act to set forth domestic and international procedures for renewal and to provide equivalent treatment, as to substantive requirements, of international and domestic registrants. Thus, as in the case of an application for registration, the renewal application may be signed by a representative, duly appointed by the registrant.

Two changes are made in the statute which conform to the Treaty, as follows:

1. The term of renewal is 10 years rather than 20, consistent with the Treaty (Article 17).
2. The time period, counted from the expiration date of the expiring term, in which a late renewal application can be filed is increased from three months to six months, corresponding to Article 17(3)(a).

Section 9(c) requires a declaration of use which requirement is applicable to all renewed registrations. Other than the three additional months in which to declare use of the mark, the only difference from present law is that the consequence of failure to satisfy the requirement is cancellation of the registration rather than refusal to renew.

SECTION 8(a) of the bill amends section 10 of the Trademark Act in several minor respects. Except for a technical change, the present provision for recording of assignments (section 10) is not changed.

Three new paragraphs have been added to the assignment section. The first two of these (i.e. 10(a)(2) and 10(a)(3)) implement Article 14 of the Treaty, under which a change in the ownership of an international registration may be recorded, by adding equivalent procedures to the national law. Thus, any applicant or registrant may record the fact that a new person has become the owner of an application filed or registration issued under the Act by complying with certain basic formalities. Paragraph (3) provides that if this step is taken within the period specified in paragraph (1) and it is followed up by the recording of instruments of assignment conforming to the requirements of paragraph (1), the constructive notice effect of recording an assignment in the Office will accrue.

The third additional paragraph (i.e. 10(a)(4)) is a special provision, implementing Article 14(5), for the benefit of one who, although not entitled to file under the Treaty, becomes the owner of an international registration by operation of law (e.g. by inheritance). Such a person may, subject to special requirements, rectify this defect by filing a regular national application.

SECTION 8(b) of the bill amends section 10 of the Trademark Act by adding two new provisions. The first of these (Section 10(b)) adds a new procedure, consistent with Article 15 of the Treaty, for recording a change in the name of the registrant.

Subsection (c) is added to clarify the procedure where a recording is void. Recordings under subsections (a) and (b) may later be determined to be void or contrary to law in another proceeding (cancellation, infringement action, etc.) under the Act. A specific provision has been added to clarify the fact that the Commissioner has the authority to correct the records and to provide a basis for denial of any international recording which formed the basis of the national entry.

SECTION 9 of the bill amends section 12(a) of the Trademark Act to provide for a "cut off" in the length of the ex parte examination of twelve months counted from the filing date of the application. Under amended section 12(a) all applications, the examination of which has not been completed, would have to be published for opposition purposes no later than 12 months from the filing date.

The reason for 12 months as the "cut off" is that the time required to effect publication, to receive oppositions (including delays in processing oppositions received on the last day), and to communicate, in the case of international registrations, all grounds of refusal or possible refusal to the International Bureau, must be taken into account in order to meet the deadlines prescribed by the Treaty (see Article 12).

It should be noted that the exact schedule for publication is left to determination by the Commissioner. There are, at least, two possibilities: (1) publication, promptly after filing, of all applications; and (2) publication (of allowed cases) after completion of the ex parte examination (as at present), or (of all still pending cases) at the expiration of 12 months, whichever event is the earlier to occur.

SECTION 10 of the bill amends section 12(b) of the Trademark Act by reducing the period of time in which to reply to an Office communication concerning the application from six to three months and by providing a time limitation applicable to notifying the applicant of grounds raised during the ex parte examination. The reduction of response time should make it possible for the Office to complete the ex parte examination of most applications within the 12 months period of amended section 12(a).

The cut off is the same as the one in amended section 12(a), i.e. 12 months, counted from the filing date. The examination need not be completed within the 12 months as the Treaty requirement is only that all grounds be communicated within that period. Also, the limitation would not apply to a new ground of refusal based on a decision of the Trademark Trial and Appeal Board or of a court.

SECTION 11 of the bill amends section 13 of the Trademark Act by providing for a time limit of 14 months for receiving oppositions. The 14 month time limitation ties in with the amendment to section 12(a) of the Act, providing equivalence of treatment of domestic and Treaty applicants. Section 13 is also amended to provide that an attorney may file an opposition on behalf of the opposer.

SECTION 12 of the bill amends section 14 of the Trademark Act in two respects, conforming this section to amended section 13, and a minor change in terminology ("date of issue").

SECTION 13 of the bill amends section 15 of the Trademark Act by a minor change in terminology ("date of issue").

SECTION 14 of the bill amends section 16 of the Trademark Act by providing specifically that an interference may be declared as to any particular application for registration of a mark only prior to the publication for opposition of that mark. While this is no different than current practice, the change in the statute seemed desirable. Since the declaration of an interference would constitute a ground of possible refusal under the Trademark Registration Treaty, such ground would have to be notified to the International Bureau within the prescribed time limit.

By requiring the declaration of the interferences prior to the date of publication, the section is subject to the same time limitation as in amended section 12(a), i.e. 12 months from the filing date.

SECTION 15 of the bill amends section 17 of the Trademark Act by providing discretionary authority to the Commissioner to defer the commencement of certain inter partes proceedings where the ex parte examination of a concerned application is not complete.

SECTION 16 of the bill amends section 21 of the Trademark Act by providing for an appeal from a refusal to accept a declaration pursuant to sections 1(c) and 9(c), as is now provided in the case of refusal of a section 8 affidavit.

SECTION 17 of the bill makes a language change in section 22 of the Trademark Act, consistent with the change from "date of registration" to "date of issue". Thus, constructive notice begins with publications of issuance of the registration (date of issue), no different in substance than under present law.

SECTION 18 of the bill amends section 23 of the Trademark Act by eliminating the requirements and provisions relating to use in the first and fourth paragraphs. Also, provision is made for treatment of applications as being under this section only where the application or the international registration (or recording of later designation) so indicates. The specific reference implements Article 11(3) which requires this treatment in the case of international registrations.

SECTION 19(a) of the bill amends section 24 of the Trademark Act by deleting the requirement that a petition to cancel a registration on the Supplemental Register be verified (consistent with amended section 14).

SECTION 19(b) of the bill amends section 24 of the Trademark Act by limiting the authority to cancel a registration on the Supplemental Register for nonuse, consistent with the use moratorium of the Treaty.

SECTION 20 of the bill amends section 30 of the Trademark Act in minor respects to remove an incidental reference to use of a mark that is inconsistent with amended section 1.

SECTION 21(a) of the bill amends section 31 of the Trademark Act by deleting the requirement of a fee for the filing of a section 8 affidavit. Since a section 8 fee cannot be assessed against a registration issued on the basis of an international registration (Article 19(1)), it is deleted in order to provide equivalence between domestic and Treaty applicants as to fees payable to the United States.

SECTION 21(b) of the bill amends section 31 of the Trademark Act by adding new subsection (d) whereby the filing and renewal fees are deemed to be substituted for by the corresponding fees set forth in the Treaty, where the international procedure is followed. This provision also obligates the Commissioner to fix the Treaty fees at the same amounts as the national fees.

SECTION 22 of the bill amends section 32(1) of the Trademark Act by providing that no infringement action may be started under the Act until the declaration of use of the mark in commerce has been filed in the Patent and Trademark Office and accepted by the Commissioner. This change implements the last sentence of Article 19(3)(a). Examination of the declaration could be accelerated if the registrant faced an impending infringement situation.

SECTION 23(a) of the bill amends section 33(a) of the Trademark Act so that the presumption of exclusive right to use the mark would apply as a rule of evidence only as to those goods and/or services in respect of which the mark is stated to be in use in commerce either in the registration itself or in the declaration under section 1(c).

SECTION 23(b) makes some minor changes in the language of section 33(b).

SECTION 23(c) amends section 33 of the Trademark Act by adding a new subsection (c) to define priority of rights accorded to applications or registrations based on an intention to use the mark. Under new subsection (c), the priority of an intent applicant or registrant would be *the same as if* he had commenced use of the mark in commerce on the filing date, unless, of course, he had an earlier priority based on use or based on the Paris Convention priority provisions of section 44(d) of the Act.

SECTION 24 of the bill amends section 35 of the Trademark Act in order to implement the last sentence of Article 19(3)(a) so that the remedies of profits and damages cannot date back prior to the date of commencement of use.

SECTION 25 of the bill renumbers present section 44(a) of the Trademark Act as section 44(a)(1) and adds to it some special provisions relating to the Trademark Registration Treaty.

Paragraph (2) authorizes the Commissioner to keep a register of international registrations designating the United States.

Paragraph (2) also contains a broad implementing provision, authorizing the Commissioner to take various actions prescribed by the Treaty. While all of the essential Treaty provisions parallel to provisions concerning domestic applications and registrations have been specifically implemented, a large number of Treaty provisions remain which solely concern the international procedures.

Paragraph (3) prescribes a procedure for communicating notifications where the deadline is stated in terms of the date of receipt by the International Bureau, most importantly the notification of refusal or possible refusal under Article 12(2)(a)(i).

Paragraph (4) implements Article 11(2)(i) of the Treaty providing for automatic registration as of the date of expiration of the time limit fixed in Article 12(2)(a)(i) where no notification of refusal or possible refusal has been received by the International Bureau.

Paragraph (5) implements Article 29 of the Treaty whereby certain delays in meeting the time limits fixed in the Treaty must be waived and others may be waived. There are some specific exceptions in the Treaty which is the reason for the last clause in this paragraph.

SECTION 26 of the bill amends section 44(c) of the Trademark Act by deleting the first sentence of this subsection. Since a person can secure a registration based on an intention to use the mark in commerce, the sentence is inconsistent with the amended Act. However, the sentence is no longer necessary. Under the amended Act all applicants would be required to declare use or an intention to use in commerce, whether or not the mark is also registered in the country of origin.

SECTION 27 of the bill deletes present subsection 44(d) of the Trademark Act and substitutes therefor a subsection providing that a right of priority may be based on a first international application as well as a first national application. Paragraph (2) of present subsection (d) is not continued. Waiver of use in commerce is no longer necessary since an application need not allege use under the amended Act. Old paragraph (4) (new paragraph (3)) of the subsection is amended to be consistent with the first sentence of section 44(c).

SECTION 28(a) of the bill amends the definitions, in section 45 of the Trademark Act, of the terms "trademark,"

"service mark," "certification mark," "collective mark" and "Intent of Act" by adding the phrase, "or intended to be used" in appropriate places consistent with the new basis for securing registrations.

SECTION 28(b) of the bill amends the definition, in section 45 of the Trademark Act, of "abandonment" to provide for abandonment of a mark applied for based on an intention to use where no use is commenced and there was never any intention to commence use. The two year prima facie abandonment provision is amended to make it clear that it applies only where use of a mark is discontinued.

SECTION 28(c) of the bill amends section 45 of the Trademark Act by adding the following new definitions:

(1) "Filing date" is defined because of its significance in respect of priority of rights in the case of an application or registration based on the intention to use;

(2) "Date of issue" is defined;

(3) "Trademark Registration Treaty" is defined;

(4) Various terms used in respect of the Trademark Registration Treaty are referenced to the Trademark Registration Treaty definitions;

(5) The terms "Owner" and "Ownership," used in capitalized form are referenced to the Trademark Registration Treaty.

This was done in order to distinguish these references from other references in the statute to "owner" or "ownership" which refer to the owner, or ownership, of a mark.

Finally, the term "owner of a trademark" is defined. The reason for this definition is discussed under SECTION 1, infra.

SECTION 29 of the bill prescribes the implementation of the various changes effected by the bill. The effective date of the Act coincides with the entry into force of the Treaty with respect to the United States. Appropriate provisions specify the controlling law which is applicable before, or on or after, the effective date.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
May 2, 1978. *Acting Commissioner of Patents and Trademarks.*

Trademark Applications Under Section 44 of the Trademark Act of 1946

[37 CFR Parts 2 and 4]

Withdrawal of Proposed Rules

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Withdrawal of proposed rules.

SUMMARY: The Patent and Trademark Office hereby withdraws its rule proposals (FR Doc. 77-23095 published in the Federal Register on August 10, 1977, 42 FR 40450; 962 TMOG 2-4, September 6, 1977) regarding applications filed under section 44 of the Trademark Act of 1946.

Under the proposed rules, foreign applicants filing under section 44 (d) or (e) of the Trademark Act of 1946, as amended, 15 U.S.C. 1126, would no longer have been required to allege use of the mark somewhere or to submit specimens or facsimiles demonstrating such use.

The primary consideration for the withdrawal of this rules proposal was the strong objection voiced by several commenters that the proposed rule changes would have placed some United States nationals in a less favorable position than foreign nationals than is the case under the present rules.

EFFECTIVE DATE: June 30, 1978.

FOR FURTHER INFORMATION CONTACT: J. Paul Williamson, Patent and Trademark Office, 703-557-2521.

SUPPLEMENTARY INFORMATION: A notice was published in the OFFICIAL GAZETTE of the United States Patent and Trademark Office on April 30, 1974 (921 OG TM 250) detailing the procedure being followed by this Office in connection with applications filed under section 44 of the Trademark Act of 1946 without specimens and without a statement of use of the mark. That notice is hereby withdrawn and the procedure thereunder terminated. Henceforth, in order to receive a formal filing date, an application under section 44 must include in the application at least one specimen and a statement that the mark has been used.

Those applicants having cases now under suspension in this Office in accordance with the April 1974 OFFICIAL GAZETTE notice will be notified individually of the Office policy regarding specimens and use as set out above.

Finally, the withdrawal of this rules proposal should in no way be interpreted as a diminution of the continuing support of the Department of Commerce and this Office for the Trademark Registration Treaty. Under that Treaty it will be possible to treat all applicants, foreign and domestic, equally in regard to initial use requirements for filing an application for trademark registration in the United States Patent and Trademark Office.

Dated: June 16, 1978.

DONALD W. BANNER,
Commissioner of Patents and Trademarks.

Approved:

JORDAN J. BARUCH,
Assistant Secretary for Science and Technology.

[FR Doc. 78-18301; Filed 6-29-78; 8:45 am]

TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

Chapter I—Patent and Trademark Office, Department of Commerce

PART 1—RULES OF PRACTICE IN PATENT CASES

PART 5—SECRECY OF INVENTIONS

Revised Patent Interference Rules

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Final rule.

SUMMARY: These regulations prescribe certain requirements for patent interference proceedings which have not been specifically or clearly covered by existing provisions of the rules. The existing provision on public availability of interference files is clarified. A proposal made earlier to eliminate atachments to preliminary statements in interferences is not adopted.

EFFECTIVE DATE: August 1, 1978.

ADDRESS: Comments on the proposal are available for public inspection in Room 11E10, Crystal Plaza Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia.

FOR FURTHER INFORMATION CONTACT: Ian A. Calvert, Chairman, Board of Patent Interferences, Patent and Trademark Office by telephone at (703) 557-3625, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: INTERFERENCE PRACTICE. On November 30, 1976, notice of proposed rulemaking regarding the revision of sections 1.205, 1.207, 1.215, 1.216, 1.217, 1.222, 1.223, 1.225, 1.245, 1.247, 3.44, 3.45, and 5.3 of, and the addition of new section 1.246 to, Title 37 of the Code of Federal Regulations was published in the Federal Register (41 F.R. 52486). Interested persons were asked to comment and a period extending from the date of publication of the proposed rule changes to March 4, 1977 was allocated for such purpose. Eighteen comments were received. The comments are available for public inspection at the address given above.

In view of strong objection to the removal of requirements in sections 1.215, 1.216, 1.217, 1.222, 1.223, 3.44 and 3.45 for documents to be attached to preliminary statements, the proposed amendments to these rules are not being adopted. The consensus of the comments submitted was that the documents required by the present rules can be most useful in promoting an early settlement of interferences. A sentence is added to § 1.223(c) to incorporate into the rules the existing policy that the content of attachments to preliminary statements normally is not considered by the Office. *Reddy* v. *Davis*, 187 USPQ 386 (Commr. Pat. & Tm. 1975). The sentence that was proposed for § 1.217 relative to the signing of statements is adopted as a new last sentence in paragraph 1.217(1).

New paragraph 1.205(c) is being adopted with a change from the proposal. The paragraph as proposed provided for a notice to be placed in the file of a patent and sent to the patentee when claims are copied by an applicant from the patent. Three commenters suggested that a second notice should be placed in the patent file and sent to the patentee if a decision is made not to declare an interference. A sentence is being added to paragraph (c) to adopt this suggestion.

One of the commenters opposed paragraph 1.205(c) on the ground that the market value of a patent will be reduced if a notice is placed in the file that claims have been copied. It is believed that the provision for a second notice when an interference is not declared responds to this objection. One commenter suggested that the notice to the patentee under paragraph 1.205(c) should identify the party copying the patent claims or the attorney representing that party. This suggestion is outside the scope of the proposal and is not adopted. The amendment that was proposed to section 5.3 is adopted in order to provide a cross-reference to new paragraph 1.205(c).

No adverse comments were received relative to the proposed revisions of sections 1.207, 1.225, 1.245, and 1.247, and the addition of new section 1.246. These proposals are being adopted. Section 1.225 is divided into paragraphs and the order of the sentences is changed from the proposal for clarity. Section 1.287(c) is amended to refer to new section 1.246 instead of section 1.245. With regard to the revision of section 1.247(b), the word "expected" is corrected to read "excepted."

FILES OPEN TO PUBLIC

The second sentence of paragraph 1.11(a) is being amended to make clear that the file of an interference involving an issued patent is open to the public if the interference is terminated without an award of priority by the Board of Patent Interferences, as well as being open when there is an award of priority. The amendment adds the phrase "or after termination if no such award is made" in the second sentence. The language that was used in paragraph 1.11(a) prior to March 1, 1977 was clear on this point. The second sentence of paragraph 1.11(a) was broadened effective March 1, 1977 (42 F.R. 5593, 955 O.G. 1054), however, to make interference files available to the public at an earlier date. In making this change the rule inadvertently was worded so that it is susceptible to the interpretation that the file of an interference is not open to the public if the interference is terminated without an award of priority. The published record shows that the Patent and Trademark Office did not intend this meaning. The Office has continued to grant public access to such files since the March 1977 amendment.

Since the change in paragraph 1.11(a) merely clarifies the rule and is consistent with existing policy, notice and public procedure prior to adoption of the change are deemed unnecessary.

TEXT OF RULES ADOPTED

As announced in the notice published in the Federal Register of November 30, 1976 (41 F.R. 52486) the Patent and Trademark Office determined that these rules do not contain a major proposal requiring preparation of an Economic Impact Statement under Executive Orders 11821 and 11949 which were in effect at that time.

In consideration of the comments received and pursuant to the authority contained in § 6 of Title 35 of the United States Code, Parts 1 and 5 of Title 37 of the Code of Federal Regulations are hereby amended as set forth below. * * *

* * * * *

[In the text set forth below, changes from the existing rules are shown by arrows and brackets, additions being indicated by arrows and deletions by brackets.]

LUTRELLE F. PARKER,
Acting Commissioner of Patents.

Date: 6–5–78.

Approved: June 20, 1978.

JORDAN J. BARUCH,
Assistant Secretary for Science and Technology.

1. In § 1.11 paragraph (a) is revised to read:

§ 1.11 *Files open to the public.*

(a) After a patent has been issued, the specification, drawings, and all papers relating to the case in the file of the patent are open to inspection by the general public, and copies may be obtained upon paying the fee therefor. After an award of priority by the Board of Patent Interferences as to all parties, ►or after termination if no such award is made,◄ the file of any interference which involved a patent, or an application on which a patent has issued, is similarly open to public inspection and procurement of copies. See § 2.27 for trademark files.

* * * * *

2. In § 1.205 a new paragraph (c) is added to read:

§ 1.205 *Interference with a patent; copying claims from patent.*

* * * * *

►(c) A notice that one or more claims of a patent have been copied or substantially copied by an applicant will be placed in the file of the patent, and a copy of said notice will be sent to the patentee. However, the identify of the applicant will not be disclosed to the patentee unless an interference is declared. If a final decision is made not to declare an interference, a notice to that effect will also be placed in the file of the patent and sent to the patentee.◄

3. In § 1.207 paragraph (b) is revised to read:

§ 1.207 *Preparation of interference papers and declaration of interference.*

* * * * *

(b) A patent interference examiner will institute and declare the interference by forwarding notices to the several parties to the proceeding. Each notice shall include the name and residence of each of the other parties and those of his attorney or agent, and of any assignee, and will identify the application of each opposing party by serial number and filing date, or in the case of a patentee by the number and date of the patent. The notices shall also specify the issue of the interference, which shall be clearly and concisely defined in only as many counts as may be necessary to define the interfering subject matter (but in the case of an interference with a patent all the claims of the patent which can be made by the applicant should constitute the counts), and shall indicate the claim or claims of the respective cases corresponding to the count or counts. [If the application or patent of a party included in the interference is a division, continuation or ccontinuation-in-part of a prior application and the examiner has determined that it is entitled to the filing date of such prior application, the notices shall so state.] ►If the primary examiner has indicated that the patent or application of any party included in the interference is entitled to the benefit of the filing date of any prior applications as to the subject matter in issue, the notices shall so state and shall specify such prior applications.◄ Except as noted in paragraph (e) of this section, the notices shall also set a schedule of times for taking various actions as follows:

(1) For filing the preliminary statements required by § 1.215 and serving notice of such filing, not less than 2 months from the date of declaration.
(2) For each party who files a preliminary statement to serve a copy thereof on each opposing party who also files a preliminary statement as required by § 1.215(b), not less than 15 days after the expiration of the time for filing preliminary statements.
(3) For filing motions under § 1.231, not less than 4 months from declaration.

4. Section 1.217 is revised to read:

§ 1.217 *Contents of the preliminary statement; invention made abroad.*

[(a)] When the invention was made abroad the facts specified by § 1.216(a) (1) to (6) are not required, and in lieu thereof there shall be stated:

(1) When the invention was introduced into this country by or on behalf of the party, giving the circumstances with the dates connected therewith which are relied upon to establish the fact and, when appropriate, including allegations of activity in this country of the nature of that represented by § 1.216(a) (1) to (6) and documentary attachments if the allegations relate to a drawing or written description. ►Such statement may be signed or sworn to, or made in the form of a declaration, either by the inventor or by one authorized to make the statement and having knowledge of the facts alleged therein.◄
(2) If a party is entitled to the benefit of the second sentence of 35 U.S.C. 104, he must so state and his preliminary statement must include allegations of activity abroad corresponding to those required by § 1.216(a) (1) to (6).

5. In § 1.223 paragraph (c) is revised to read:

§ 1.223 *Effect of Statement.*

* * * * *

(c) If a party to an interference fails to file a statement, testimony will not be received subsequently from him to prove that he made the invention at a date prior to his effective filing date. If a party alleges in his statement a date of first drawing or first written description but does not atach a copy of such drawing or written description as required by § 1.216(b), he will be restricted to his effective filing date as to that allegation unless such copy is admitted by motion under § 1.222. ►The content of a drawing or writ-

ten description attached to the statement normally will not be considered by the Office.◄

* * * * *

6. Section 1.225 is revised to read :

§ 1.225 *Failure of junior party to file statements or to overcome filing date of senior party.*

►(a)◄ If a junior party to an interference fails to file a preliminary statement, or if his statement fails to overcome the effective filing date of the application of another party, judgment on the record will be entered against such junior party unless he has filed a proper motion under § 1.231, within the time set for such motions, seeking some action in the interference. If such motion has been timely filed but does not result in action in the interference which removes the basis for a judgment on the record, such judgment will be entered unless the motion related to a matter which may be reviewed at final hearing under § 1.258, and within 30 days of the decision denying his motion, or a later time set by the patent interference examiner, the junior party concerned requests that final hearing be set to review such matter. Also, such a junior party may within such 30 day period, or time set, request a final hearing to review such a matter raised by his opposition to a motion under § 1.231(a)(2), (3), (4), or (5) which was granted over his opposition.

►(b)◄ Such a junior party will not be permitted to take testimony except on granting of a motion accompanied by a showing of good cause, which should normally include names of proposed witnesses and affidavits or declarations by them giving their expected testimony.

►(c) If, as a result of a decision on motion, the original senior party is deprived of the benefit of an earlier filed application and is thereby made a junior party and if in addition he relies solely on said earlier filed application in his preliminary statement, he stands in the same position as a junior party whose statement fails to overcome the effective filing date of the senior party as in the first sentence of § 1.225(a).◄

7. Section 1.245 is revised to read :

§ 1.245 *Extension of time.*

Extensions of time in any case not otherwise provided for may be had by stipulation of the parties, subject to approval, or on motion duly brought, sufficient cause being shown for such extension. [A motion not timely made may be considered upon a showing of sufficient cause as to why such motion was not timely presented.]

8. A new § 1.246 is added to read :

►§ 1.246 *Late papers.*

A motion or other paper belatedly filed will not normally be considered except upon a showing, under oath or in the form of a declaration (§ 1.68), of sufficient cause as to why such motion or paper was not timely presented.◄

9. Section 1.247 is revied to read.

§ 1.247 *Service of papers.*

►(a)◄ Every paper filed in the Patent and Trademark Office in interference proceeding must be served upon the other parties in the manner provided in § 1.248, except the following :

[(a)] ►(1)◄ Preliminary statements at the time of filing but see § 1.215(b) and (c) [.] ►.◄

[(b)] ►(2)◄ Documentary exhibits introduced at the taking of a deposition.

[(c)] ►(3)◄ Certified transcripts of testimony under § 1.276 (but copies of the record must be served [(§ 1.253a)).] ►(§ 1.253(a)).◄

[(d)] ◄(4)◄ Statutory [declaimers] ►disclaimers◄ under 35 U.S.C. 253.

►(b)◄ The specification in certain sections that a designated paper must be served does not imply that other papers, not [expected] ►excepted◄ above need not be served. However, the requirement for service of designated papers may be waived under particular circumstances and service may be required of other designated papers which need not ordinarily be served. Proof of [such] service must be made before the paper will be considered in the interference by the Office. A statement of the attorney, attached to or appearing in the original paper when filed, clearly stating the time and manner in which service was made will be accepted as [prima facie] ►*prima facie*◄ proof of service.

10. In § 1.287, paragraph (c), first sentence, "§ 1.245" is changed to "§ 1.246."

11. In § 5.3, paragraph (b), at the end of the paragraph, "See § 1.205(c)." is added.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,544,399, Re. S.N. 911,653, Filed Jun. 1, 1978, Cl. 148/184, INSULATED GATE FIELD-EFFECT TRANSISTOR (IGFET) WITH SEMICONDUCTOR GATE ELECTRODE, Hans G. Dill, Owner of Record: *Hughes Aircraft Company, Culver City, Calif.,* Attorney or Agent: William H. MacAllister, Ex. Gp.: 111

3,955,953, Re. S.N. 911,567, Filed Jun. 1, 1978, Cl. 65/18, METHODS OF MAKING SELF FILTERING NOZZLES, Anthony J. Hauser, Owner of Record: *Teletype Corporation, Skokie, Ill.,* Attorney or Agent: J. B. Hoofnagle, Jr., Ex. Gp.: 173

3,959,678, Re. S.N. 906,438, Filed May 17, 1978, Cl. 310/172, CONCENTRATED WINDING SALIENT-POLE SHADED POLE MOTORS HAVING MULTIPLE SHORT CIRCUITED SHADING COILS FOR EACH POLE, Joe T. Donahoo, Owner of Record: *General Electric Company, Fort Wayne, Ind.,* Attorney or Agent: John M. Stoudt, et al., Ex. Gp.: 212

3,961,092, Re. S.N. 904,970, Filed May 11, 1978, Cl. 426/331, METHOD FOR PRESERVING HIGH MOISTURE CONTENT AGRICULTURAL GRAINS, Joseph G. Forest et al., Owner of Record: *Inventor,* Attorney or Agent: Mark P. Levy, Ex. Gp.: 172

3,962,833, Re. S.N. 906,745, Filed May 17, 1978, Cl. 51/284, METHOD FOR THE ALTERATION OF A LENS AND AN ADHESIVE BLOCKING PAD USED THEREIN, Dee Lynn Johnson, Owner of Record: *Inventor,* Attorney or Agent: Cruzan Alexander, et al., Ex. Gp.: 323

3,979,884, Re. S.N. 875,602, Filed Feb. 6, 1978, Cl. 53/381 R, MAIL EXTRACTING AND SORTING DESK, Robert J. Russell, Owner of Record: *Opex Corporation, Cherry Hill, N.J.,* Attorney or Agent: Alfred Stapler, et al., Ex. Gp.: 324

3,983,309, Re. S.N. 911,738, Filed Jun. 2, 1978, Cl. 13/6, PRIMARY ELECTRODE ARRANGEMENT FOR HIGH TEMPERATURE MELTING FURNACE, Duane Harold Faulkner, et al., Owner of Record: *Johns-Manville Corporation, Greenwood Village, Colo.,* Attorney or Agent: Charles C. Corbin, Ex. Gp.: 212

3,989,851, Re. S.N. 909,598, Filed May 25, 1978, Cl. 426/266, METHOD FOR PROTEIN FORTIFICATION OF EXTRA PUMPED MEATS, Robert Lyle Hawley, et al., Owner of Record: *Ralston Purina Company, St. Louis, Mo.,* Attorney or Agent: R. W. Brukardt, et al., Ex. Gp.: 172

3,992,064, Re. S.N. 903,886, Filed May 8, 1978, Cl. 303/7, VEHICLE BRAKE SYSTEM, Michael L. Carton, et al., Owner of Record: *Wagner Electric Corporation, Parsippany, N.J.,* Attorney or Agent: William D. Lucas, et al., Ex. Gp.: 315

4,008,172, Re. S.N. 894,262, Filed Apr. 7, 1978, Cl. 252/301.21, AGENT FOR BRIGHTENING AND REMOVING GREYNESS FROM TEXTILES, Richard von Rutte, et al., Owner of Record: *Inventor,* Attorney or Agent: Karl F. Jorda, et al., Ex. Gp.: 114

4,018,656, Re. S.N. 912,139, Filed Jun. 2, 1978, Cl. 203/11, THERMAL SOFTENING AND DISTILLATION BY REGENERATIVE METHOD, Alfred N. Rogers, et al., Owner of Record: *Bechtel International Corporation, San Francisco, Calif.,* Attorney or Agent: Stephen S. Townsend, Ex. Gp.: 171

4,023,433, Re. S.N. 907,808, Filed May 19, 1978, Cl. 74/425, POWER TRANSFER, Ewald Schutz, Owner of Record: *Power Transfer Corporation, Lancaster, Pa.,* Attorney or Agent: Karl L. Spivak, et al., Ex. Gp.: 345

4,048,355, Re. S.N. 909,720, Filed May 25, 1978, Cl. 427/375, PROCESS FOR THE FORMATION OF A POLYOLEFIN COATING LAYER ONTO A METAL SURFACE, Seigo Sakayori, et al., Owner of Record: *Mitsui Petrochemical Ind., Ltd.; Toa Paint Co., Ltd., Tokyo, Japan,* Attorney or Agent: Leonard W. Sherman, Ex. Gp.: 162

4,066,403, Re. S.N. 907,362, Filed May 18, 1978, Cl. 23/230 B, MULTILAYER ANALYTICAL ELEMENT, Barbara J. Bruschi, Owner of Record: *Eastman Kodak Company, Rochester, N.Y.,* Attorney or Agent: Dana M. Schmidt, et al., Ex. Gp.: 171

4,073,282, Re. S.N. 909,719, Filed May 25, 1978, Cl. 126/270, SOLAR PANEL, Arno H. Schriefer, Jr., Owner of Record: *Inventor,* Attorney or Agent: Jack E. Dominik, Ex. Gp.: 344

PATENT NOTICES

Certificates of Correction for the Week of Aug. 1, 1978

Re. 29,239	4,053,363	4,069,169	4,077,163
3,784,599	4,054,475	4,069,317	4,077,212
3,818,258	4,055,672	4,069,985	4,077,521
3,889,535	4,056,676	4,070,970	4,077,891
3,939,208	4,058,501	4,071,374	4,077,965
3,965,172	4,059,051	4,072,027	4,078,498
3,997,272	4,061,403	4,072,206	4,078,888
4,023,440	4,061,999	4,072,646	4,079,449
4,031,395	4,062,276	4,072,851	4,079,566
4,034,136	4,062,348	4,073,574	4,079,660
4,034,772	4,062,458	4,074,011	4,079,909
4,041,084	4,063,893	4,075,052	4,080,097
4,042,488	4,063,933	4,076,229	4,080,114
4,044,337	4,064,999	4,076,534	4,080,120
4,050,296	4,065,506	4,076,611	4,080,158
4,051,655	4,066,662	4,076,777	
4,053,110	4,067,112	4,076,830	

Disclaimers

3,037,057.—*Samuel W. Tinsley,* South Charleston, and *John T. Fitzpatrick,* Charleston, W. Va. PRODUCTION OF AROMATIC AMINOALCOHOLS. Patent dated May 29, 1962. Disclaimer filed May 30, 1978, by the assignee, *Union Carbide Corporation.*

Hereby enters this disclaimer to claims 7, 8 and 9 of said patent.

3,929,049.—*Curtis L. Graversen,* Milwaukie, Oreg. EXTENDED PITCH SAW CHAIN. Patent dated Dec. 30, 1975. Disclaimer filed June 14, 1978, by the assignee, *Omark Industries, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

4,070,450.—*Richard Barner,* Witterswil, and *Walter Boguth,* Riehen, Switzerland. SUNSCREENING COMPOUND AND METHOD. Patent dated Jan. 24, 1978. Disclaimer filed June 8, 1978, by the assignee, *Hoffmann-La Roche Inc.*

Hereby enters this disclaimer to claim 16 of said patent.

Dedication

3,991,279.—*Dennis James Morgan,* Howell, and *Douglas Charles Smith,* Locust, N.J. MONOBUS INTERFACE CIRCUIT. Patent dated Nov. 9, 1976. Dedication filed June 2, 1978, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby dedicates to the Public the entire term of said patent.

Patents Available for Licensing or Sale

3,770,297. TRAVEL HOME WITH CAR TOP HITCH. Robert G. Quick, Hy-Rider Associates, 7419 Allstate Drive, Petersburg, Va. 23803.

4,034,611. PARTICULATE SAMPLING PROBE. James E. Harling. Correspondence to: M. F. Laughton, APCO-ERS Environment Canada, Ottawa, K1a 1C8, Canada.

4,074,538. WALL STRUCTURES. Jurgen, Peter Janus, Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Services (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St. SW.
Washington, D.C. 20324

Patent 4,070,661. Photo Electronic Direction of Motion Indicator. Filed Feb. 10, 1976. Patented Jan. 24, 1978. Not available NTIS.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 745,942. Magnetohydrodynamic Electrode. Filed Nov. 29, 1976.

Patent 4,057,678. Molten Salt Battery Having Inorganic Paper Separator. Filed Mar. 16, 1977. Patented Nov. 8, 1977. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Building, Bethesda, Md. 20014

Patent application 850,810. Duel Circuit, Woven Artificial Capillary Bundle for Cell Culture. Filed Nov. 11, 1977.

Patent 4,006,413. Field Instrument for Measurement of AC Voltage Fluctuations. Filed Dec. 19, 1974. Patented Feb. 1, 1977. Not available NTIS.

Patent 4,050,533. Powered Wheel Chair. Filed June 22, 1976. Patented Sept. 27, 1977. Not available NTIS.

Patent 4,053,952. Magnetic Fluid Actuated Control Valve, Relief Valve and Pump. Filed Apr. 8, 1977. Patented Oct. 18, 1977. Not available NTIS.

Patent 4,073,194. Noise Chrono-Dosimeter System. Filed Oct. 8, 1976. Patented Feb. 14, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts, NW.
Washington, D.C. 20240

Patent application 870,162. Ventilation System for Continuous Mining Machines. Filed Jan. 17, 1978.

Patent 4,053,575. Sulfur Recovery From H_2S and SO_2-Containing Gases. Filed Mar. 15, 1976. Patented Oct. 11, 1977. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research,
Code 302, Arlington, Va. 22217

Patent application 846,091. Method and Means for Defocusing Engine Cavity Reflected Energy. Filed Oct. 27, 1977.

Patent application 851,243. Hydrogen-Oxygen Mixer. Filed Nov. 14, 1977.

Patent application 853,656. Single-Fiber Duplex Coupler. Filed Nov. 21, 1977.

Patent application 855,035. Supercorroding Alloys for Generation of Heat and Gas. Filed Nov. 25, 1977.

Patent application 855,633. Expanding Stabilizing Fin Cup. Filed Nov. 28, 1977.

Patent application 867,631. High Lateral Load Capacity, Free-Fall Deadweight Anchor. Filed Jan. 9, 1978.

Patent application 870,048. Constant Illumination Control System. Filed Jan. 16, 1978.

Patent application 870,387. Grinding and Polishing Tool, Filed Jan. 18, 1978.

Patent application 871,265. Laser Marksmanship Target. Filed Jan. 23, 1978.

Patent application 871,313. Image Stabilizing System for Stop-Action Playback. Filed Jan. 23, 1978.

Patent application 874,093. Passive High-Speed Automatic Shutter for Imaging Devices. Filed Jan. 31, 1978.

Patent application 876,297. Photochemical Separation of Metals in Solution by Precipitation Following Reduction or Oxidation. Filed Feb. 9, 1978.

Patent application 876,373. Laser Safety Goggles. Filed Feb. 9, 1978.

Patent application 876,447. Spiral-Passage-Honeycomb Chemical Converter-Heat Exchanger. Filed Feb. 9, 1978.

Patent 3,934,259. All-Sky Camera Apparatus for Time-Resolved Lightning Photography. Filed Dec. 9, 1974. Patented Jan. 20, 1976. Not available NTIS.

Patent 4,011,418. Vibration Responsive Switch. Filed Oct. 18, 1963. Patented Mar. 8, 1977. Not available NTIS.

Patent 4,012321. Oxidation of Refractory Organics in Aqueous Waste Streams by Hydrogen Peroxide and Ultraviolet Light. Filed Mar. 25, 1975. Patented Mar. 15, 1977. Not available NTIS.

Patent 4,012,613. Inertial Switch. Filed Oct. 18, 1963. Patented Mar. 15, 1977. Not available NTIS.

Patent 4,025,848. Waveform Comparing Phasemeter. Filed Sept. 11, 1975. Patented May 24, 1977. Not available NTIS.

Patent 4,029,529. Crosslinked Carboxyl Containing Polymer and Nitrocellulose as Solid Propellant Binder. Filed July 12, 1967. Patented June 14, 1977. Not available NTIS.

Patent 4,037,517. Fuze Activation Device. Filed Sept. 24, 1976. Patented July 26, 1977. Not available NTIS.

Patent 4.051,390. Parallel/Time-Shared Variable Time Delay Generator With Common Timing Control and Fast Recovery. Filed June 18, 1976. Patented Sept. 27, 1977. Not available NTIS.

Patent 4,051,437. Method and Apparatus for Semiconductor Profiling Using an Optical Probe. Filed Apr. 2, 1976. Patented Sept. 27, 1977. Not available NTIS.

Patent 4,062,605. Portable Seating Apparatus. Filed Oct. 4, 1976. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,063,186. Broadband Millimeter Wave Amplifier. Filed Oct. 10, 1975. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,063,291. Apparatus and Method for Encoding and Decoding Digital Information. Filed Oct. 15, 1976. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,064,360. High Speed Digital Switch. Filed July 6, 1976. Patented Dec. 20, 1977. Not available NTIS.

Patent 4,066,234. Universal Shock and Vibration Mounts. Filed Jan. 23, 1974. Patented Jan. 3, 1978. Not available NTIS.

Patent 4,066,878. Time-Domain Filter for Recursive Type Signals. Filed Mar. 29, 1976. Patented Jan. 3, 1978. Not available NTIS.

Patent 4,067,392. Toxic Gas Control for BF Absorber Fires. Filed May 24, 1976. Patented Jan. 10, 1978. Not available NTIS.

Patent 4,067,860. N,N'-bis(3,4-dicyanophenyl) alkanediamide, Polyphthalocyanines, and Preparation Thereof. Filed July 23, 1976. Patented Jan. 10, 1978. Not available NTIS.

Patent 4,069,059. Silicon Nitride-Zirconium Silicate Ceramics. Filed June 11, 1976. Patented Jan. 17, 1978. Not available NTIS.

Patent 4,070,092. Active Waveguide Branch With Variable Synchronism. Filed Sept. 22, 1976. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,070,211. Technique for Threshold Control Over Edges of Devices on Silicon-on-Sapphire. Filed Apr. 4. 1977. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,070,412. Method for Production of Acetylene by Laser Irradiation. Filed Sept. 8, 1976. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,070,463. Antimotion Sickness Remedy. Filed Mar. 3, 1976. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,071,194. Means for Cooling Exhaust Nozzle Sidewalls. Filed Oct. 28, 1976. Patented Jan. 31, 1978. Not available NTIS.

Patent 4,071,907. Radar Signal Processor Utilizing a Multi-Channel Optical Correlator. Filed Oct. 12, 1976. Patented Jan. 31, 1978. Not available NTIS.

Patent 4,072,949. Range Gate Walk-Off of Compressive Radar. Filed Mar. 17, 1970. Patented Feb. 7, 1978. Not available NTIS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 15, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	9-6-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-17-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-17-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	7-18-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-1-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-8-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-13-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-11-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-3-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	10-14-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-23-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-9-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	5-11-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-2-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-19-77

Expiration of patents: The patents within the range of numbers indicated below expire during July 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,990,549 to 2,994,086, inclusive
Plant Patents..... Numbers 2,067 to 2,075, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED AUGUST 1, 1978

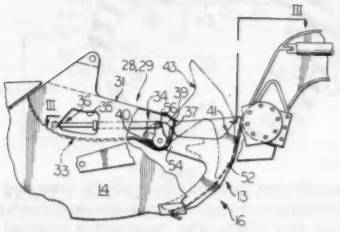
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T973,001
SCRAPER APRON ASSEMBLY

Carroll R. Cole, Decatur, and Edward J. Ohms, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 788,858, Apr. 19, 1977, abandoned.
This application Nov. 10, 1977, Ser. No. 850,432
Int. Cl.[2] E02F *5/00*
U.S. Cl. 37—126 AD
2 Sheets Drawing. 8 Pages Specification



A scraper apron assembly has a bowl member which has a front opening and first and second sides. Each of the sides has an upper portion and extends rearwardly from the front opening. Each of the upper portions has first and second end portions with a slot in the second end portion.

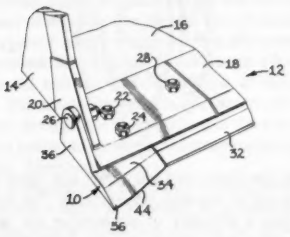
An apron is of a size sufficient for closing the front opening, and is pivotally connected and movable through the bowl.

Each of the first and second actuating motors have first and second ends and are positioned between the first and second walls of the bowl. The motors are pivotally connected at their first ends to the apron through respective flanges and at their second ends to first and second walls of the bowl.

T973,002
REPLACEABLE CORNER CUTTING EDGE

Gene R. Klett, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 22, 1977, Ser. No. 863,485
Int. Cl.[2] E02F *9/28*
U.S. Cl. 37—142 R
2 Sheets Drawing. 7 Pages Specification

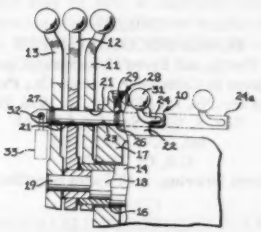


A replaceable cutting edge includes a substantially horizontal bottom plate having an upright opening therethrough, a side wall and a tapered front edge, and a substantially vertical side plate integrally secured to the bottom plate adjacent the side wall. The side plate has upwardly converging front and rear surfaces forming an apex and a substantially horizontal opening through the apex. The cutting edge is positioned protectively over the corner of an implement such as a loader bucket, and is positively secured thereat through bolts through the openings.

T973,003
LEVER LOCKING ASSEMBLY

Orson K. Kelly, and Henry J. Perez, both of Aurora, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 8, 1978, Ser. No. 884,676
Int. Cl.[2] G05G *5/08*
U.S. Cl. 70—200
1 Sheets Drawing. 6 Pages Specification



Each of a plurality of levers has a hole extending therethrough with the holes being in axial alignment at a nonoperational position of the levers. A lock bolt is slidably positioned within a bore of a bracket mounted adjacent one of the levers and is movable therethrough to a first position at which the bolt extends through the holes in the levers for maintaining the levers in the nonoperational position and a second position at which the bolt is retracted from the holes and the levers are free to move to their operational positions.

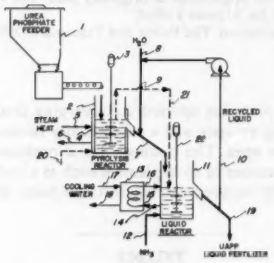
T973,004
PRODUCTION OF UREA-AMMONIUM POLYPHOSPHATES FROM UREA PHOSPHATE

John M. Stinson, 1525 Ridge Dr., Sheffield, Ala. 35660; Horace C. Mann, Jr., 1942 Holiday Dr., and John F. McCullough, 2909 Alexander, both of Florence, Ala. 35630, assignors to Tennessee Valley Authority

Filed Oct. 3, 1977, Ser. No. 838,503
Int. Cl.[2] C05C *9/00*
U.S. Cl. 71—29
5 Sheets Drawing. 32 Pages Specification

A process for the production of high-purity urea-ammonium polyphosphate fertilizers from crystalline urea orthophosphate derived from the reaction of wet-process acid and urea. Initially, urea phosphate was pyrolyzed in one stage to give molten urea-ammonium polyphosphates that contained up to 95 percent of the phosphate as polyphosphate, dependent upon the reaction conditions used. Heat to effect condensation of orthophosphate with urea to form polyphosphate was provided by steam. Reaction conditions ranging from a retention time of 1 minute at 350° F to 30 minutes at 260° F were satisfactory. The pyrolyzate contained mixtures of urea, ammonium orthophosphate, and ammonium polyphosphates and was dissolved in aqua ammonia to yield clear liquid fertilizers contain-

ing 12 to 15 percent nitrogen and 18 to 29 percent P_2O_5. Addition of either urea to the process to maintain a urea:biuret ratio of at least 16, or about 2 pounds NH_3 per unit P_2O_5 to the pyrolysis reactor prevented biuret precipitation in the liquid



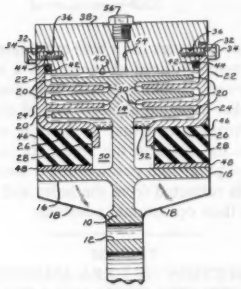
fertilizers. Granulation of urea-ammonium polyphosphate melt by conventional means gave solids containing 19 to 21 percent N and 45 to 47 percent P_2O_5. Supplementary, secondary, or micronutrient-containing materials may be incorporated in the liquid or solid products.

T973,005

TUNED VISCOUS DAMPER

Tsu Pin Shyu, Peoria, and Byron H. Lofquist, Creve Coeur, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 733,485, Oct. 18, 1976. This application Nov. 9, 1977, Ser. No. 850,893
Int. Cl.[2] F16F *15/00*
U.S. Cl. 74—574
2 Sheets Drawing. 17 Pages Specification



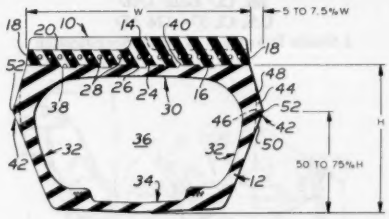
A tuned viscous damper including a hub adapted to receive a rotational input force, a first element carried by the hub having a plurality of spaced, annular fins directed generally axially of the hub and concentrically therewith, a second element having a plurality of spaced, annular fins directed generally axially of the hub and concentric therewith, the fins on the first element projecting into the spaces between the fins on the second element in noncontacting relation, an annular inertia weight, an annular spring secured to the second means and to one of the inertia weight and the hub, a housing including at least one of the first and second elements, the inertia weight and the annular spring defining a closed chamber encompassing the fins, and a body of viscous liquid at least partially filling the chamber. The first element is a web and carries its fins on both sides thereof. The second element is a housing and comprises two identical parts each having fins thereon with the identical parts being disposed on opposite sides of the web such that the fins thereon are directed toward the web. All of the fins are generally axially extending. The housing and/or the web can be formed of metals having low densities or of metals which are principally ferrous in composition, as desired, to adjust the mass ratio of the damper without changing the geometry of the parts.

T973,006

REPLACEABLE TIRE TREAD BELT AND TIRE CARCASS WITH A BUTTRESSED SIDEWALL

Marvin E. Beyers, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 23, 1978, Ser. No. 880,821
Int. Cl.[2] B60C *11/00*
U.S. Cl. 152—176
1 Sheets Drawing. 7 Pages Specification



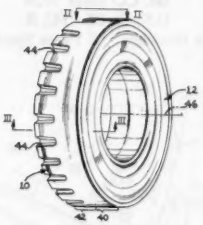
A replaceable tire tread belt has radially outer and inner peripheral surfaces and a pair of opposite side surfaces defining a preselected axial width. The tread belt is mounted on a tire carcass having a radially outer peripheral portion, a facing pair of sidewalls, and a radially inner base portion. A buttressed deflector of preselected cross sectional configuration extends axially outwardly from at least one sidewall of the tire carcass a distance axially beyond the tread belt of from 5 to 7½% of the preselected axial width for deflecting external objects away from the sidewall.

T973,007

REPLACEABLE TIRE TREAD BELT

Marvin E. Beyers, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 23, 1978, Ser. No. 880,668
Int. Cl.[2] B60C *11/00*
U.S. Cl. 152—176
1 Sheets Drawing. 7 Pages Specification



A replaceable tire tread belt has outer and inner peripheral surfaces and a pair of opposite side surfaces. The inner peripheral surface has a plurality of projections for interlocking engagement with a tire carcass, and the outer peripheral surface is axially divided into a smooth portion extending about the circumference and providing an extended service life, and a grooved portion extending about the circumference and defining the remaining portion of the outer peripheral surface and providing traction.

T973,008
METHOD FOR REMOVING LAYERS OF ORGANIC MATERIAL

Leon H. Kaplan, Yorktown Heights, N.Y.; Nungavaram S. Viswanathan, Lancaster, Calif., and Steven M. Zimmerman, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

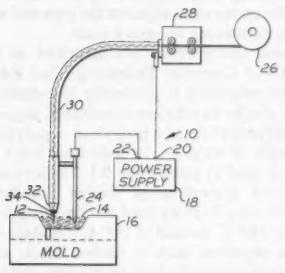
Continuation of Ser. No. 743,190, Nov. 19, 1976, abandoned.
This application Dec. 9, 1977, Ser. No. 858,985
Int. Cl.[2] B08B *3/08*
U.S. Cl. 134—3
No Drawing. 14 Pages Specification

Organic materials, such as organic polymer resist layers, are removed from substrates by contacting the materials with a mixture consisting essentially of an alkali metal persulfate and concentrated (96%) sulfuric acid wherein the mixture contains from above about 13 to about 50 grams of alkali metal persulfate per 100 milliliters of sulfuric acid.

T973,009
APPARATUS AND METHOD FOR HEATING A CONTROLLED, MOVING WIRE CONTAINING TREATING AGENTS

John G. Frantzreb, Sr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 9, 1977, Ser. No. 849,730
Int. Cl.[2] B22D *27/20*
U.S. Cl. 164—50
1 Sheets Drawing. 7 Pages Specification



An electric circuit controllably heats a controlled, moving wire containing treating agents during entry of the wire into molten metal of a mold. The electric circuit includes an electrode and a power supply which has first and second terminals. The first terminal is connected to the wire at a location spaced from the mold and the second terminal is connected to the electrode. The electrode extends into the mold and forms a current path through the molten metal to the wire. The wire is controllably heated to a preselected temperature in response to current flow therethrough.

A method of heating the controlled, moving wire during entry of the wire into a mold is provided by connecting the power supply to the wire at a location outside the mold to the electrode which extends into the mold; submerging selected portions of the wire and electrode into the molten metal and forming the electric circuit; and delivering current to the wire of a magnitude sufficient for increasing the temperature of the wire to a preselected temperature.

T973,010
ELECTRICAL CONDUCTOR SYSTEMS

Kenneth Herbert McDonald, 6 Wallabah St., Mount Waverley 3149 Victoria, Australia

Filed Sep. 9, 1975, Ser. No. 613,881
Int. Cl.[2] B60M *1/12*
U.S. Cl. 191—23 A
1 Sheets Drawing. 10 Pages Specification

An electrical conductor system to supply power to a travelling collector comprises an elongated hollow conduit formed with a continuous longitudinally extending slot. An insulating layer is bonded to the outer surface of the conduit and the conduit may be used as the sole current carrier. A continuous elongated conductor may be held in electrical contact with the inner surface and supported by discrete lengths of conduit in a position where the conductor is adapted to be contacted by a brush extending through the slot.

T973,011
CALENDERABLE PROPYLENE POLYMER COMPOSITIONS

Peter Ernest Waghorn, 29 Brockswood La., Welwyn Garden City, Hertfordshire, England

Filed Jul. 1, 1977, Ser. No. 812,439
Claims priority, application United Kingdom, Jul. 13, 1976, 29059/76; Mar. 29, 1977, 13126/77
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—23 H
1 Sheets Drawing. 20 Pages Specification

Crystalline polypropylene compositions of low melt flow index which can be calendered into foils having a melt flow index of below 5 are obtained by using a soap and a particulate inorganic material together with highly effective stabilizer systems. Low melt flow index polypropylene polymers and copolymers are rendered adequately resistant to degradation while in the molten state associated with a calendering process.

A composition calenderable into foils and which comprises:

a. a crystalline homopolymer of propylene and/or a crystalline copolymer of propylene with up to **25%**, preferably from over **5** up to **17%**, by weight of ethylene,
b. from **0.1** to **1.5%**, preferably **0.15** to **0.3%**, by weight of a "highly effective stabilizer system" as defined below,
c. from **0.1** to **2.0%**, preferably **0.15** to **0.8%**, by weight of a soap as described, and
d. **10** to **60%**, preferably **15** to **45%** by weight of a solid particulate inorganic material is described.

The percentages quoted are based on the weight of the polymer and/or copolymer present in the composition.

Preferred highly efficient stabilizers are pentaerythritol tetra-β-3,5-ditertiary butyl-4-hydroxyphenyl propionate and tris(3,5-ditertiary butyl-4-hydroxybenzyl) isocyanurate but stabilizers such as 2,6-ditertiary butyl-4-methyl phenol or 1,1,3-tris(2′-methyl-5′-tertiary butyl-4-hydroxy phenyl) butane are also effective.

T973,012

COMPOSITIONS SUITABLE FOR MAKING FLOOR TILE

Kenneth W. Hyche, Rte. 3, Cooks Valley Rd., and Martin F. Schick, 1360 Holyoke St., Apt. 28, both of Kingsport, Tenn. 37664

Continuation of Ser. No. 657,348, Feb. 11, 1976. This application Dec. 14, 1977, Ser. No. 860,499
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—23 H
No Drawing. 13 Pages Specification

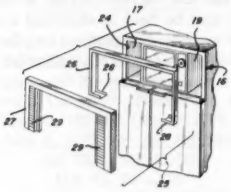
A molding composition capable of forming floor tile comprising (1) about 100 parts of an ethylene containing thermoplastic rubber, (2) about 50 to 200 parts of polyolefin and (3) about 100 to 700 parts filler.

T973,013

COMBINED MICROWAVE OVEN AND REFRIGERATOR

Frank I. Ferrara, Newburgh, Ind., and Samuel J. Pearson, St. Joseph, Mich., assignors to Whirlpool Corporation

Filed Sep. 19, 1977, Ser. No. 834,761
Int. Cl.[2] A47B *83/00*
U.S. Cl. 312—237
1 Sheets Drawing. 12 Pages Specification



A refrigerated appliance having a cabinet defining a pair of cavities and an apparatus for refrigerating one of the cavities. The refrigerated cavity is provided with doors for selectively closing the refrigerated cavity. The other of the cavities defines an opening and is adapted to receive a freestanding microwave oven having an integral door. The open cavity may be provided with a trim for adapting the cavity to any one of a plurality of different microwave ovens electrically disposed therein. The trim may define a vent for providing the microwave oven with cooling air flow circulation. The refrigeration apparatus may define a freestanding cabinet with the microwave oven defining a freestanding oven carried on a horizontal support wall at the top of the refrigeration space.

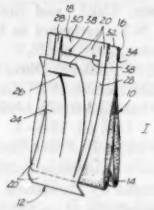
T973,014

IMMERSIBLE BAG FOR EXHAUSTABLE SUBSTANCES

Adolf Rambold, Bachstrasse 8, D-4005 Meerbusch 1, Fed. Rep. of Germany

Filed Jan. 19, 1978, Ser. No. 870,727
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1977, 2755203
Int. Cl.[2] A47G *19/16;* B65B *29/04*
U.S. Cl. 426—83
1 Sheets Drawing. 14 Pages Specification

An immersible bag (**10**) for exhaustable substances, with a bag containing the substance, which bag has a closed bag opening on the bag head (**16**), and with a bendable strip (**12**) folded along a transversely extending fold line, the strip having two legs continuously connected at the fold line, which legs are fastened on the bag and which legs receive therebetween the bag head adjacent the fold line, whereby the inner surface of the strip (which inner surface faces the bag) is formed at least at the fastening places by a thermoplastic synthetic material which is welded at the fastening places on the bag. The strip and the bag are spot welded at least at a spot or point-shaped fastening spot (**38**) on both outer sides of the bag, in the manner



that the synthetic material is fused at the fastening spots with the porous material of the bag.

T973,015

CATHODICALLY PROTECTED POLYOLEFIN COATED PIPELINES

Julian Burrell Chadwick, 23 Linwood Rd., Ware, Hertfordshire, and Victor George Kendall, 9 Ducketts Wood, Thundrige, Ware, Hertfordshire, both of England

Filed Sep. 26, 1977, Ser. No. 836,570
Claims priority, application United Kingdom, Jun. 29, 1977, 27190/77
Int. Cl.[2] F16L *58/02*
U.S. Cl. 428—36
No Drawing. 18 Pages Specification

The resistance to stress cracking or cathodic disbonding of an external polyolefin coating on a cathodically protected pipeline, especially a steel pipe for conveying fuel gas at high pressure, is improved by including 1–18%, preferably 4–8%, by weight, based on the polyolefin, of cured epoxy resin in at least the region of the polyolefin coating adjacent the pipe. The concentration of cured epoxy resin may be uniform throughout, or the coating may comprise a primer layer of polyolefin containing the epoxy resin adjacent the pipe and an outer layer of polyolefin containing no epoxy resin.

Suitably cured epoxy resins are described in Kirk-Othmer Encyclopedia of Chemical Technology 2nd Ed. Vol. 8, pp. 294–312. The polyolefin is preferably low-density polyethylene but may also be an ethylene copolymer, high-density polyethylene, polypropylene or a propylene copolymer with up to 20% by weight of ethylene. Its melt flow index is preferably 0.1–200 when used as primer and 0.1–2 otherwise (units g/10 min. measured according to British Standard 2782:Part 1/105C/1976 using 2–16 kg load and for propylene polymers performed at 230° C. instead of 190° C.). Stabilizers, especially antioxidants, pigments such as carbon black, e.g. 1–5% by weight and peroxy cross-linking agents may also be included in the polyolefin compositions.

The powdered composition may be coated by electrostatic spraying onto the heated pipe, e.g. at 190° C. for low-density polyethylene, with possible subsequent application by extrusion or otherwise of polyolefin containing no epoxy resin. It may alternatively be strew-coated onto the pipe heated to a higher temperature, e.g. 320° C.

T973,016

CYANOETHYLATION OF HYDANTOINS

Samuel Ellsworth Shull, Cogan Station, Pa., and John Douglas Freilich, Grand Island, N.Y., assignors to Glyco Chemicals, Inc., Greenwich, Conn.

Continuation of Ser. No. 747,987, Dec. 6, 1976, abandoned. This application Oct. 27, 1977, Ser. No. 846,019
Int. Cl.[2] C07D *233/72*
U.S. Cl. 548—312
No Drawing. 18 Pages Specification

An improved process for the manufacture of a 3-β-cyanoethyl-

or a 1,3-di(β-cyanoethyl)-5,5-disubstituted hydantoin, by reacting acrylonitrile and a 5,5-disubstituted hydantoin in the presence of a base catalyst in a solvent media composed of a secondary and/or tertiary alcohol having up to 5 carbon atoms and a boiling point from between about 80°–135° C as a reaction solvent. The alcohol reaction solvent may be used for crystallization of the cyanoethylated product.

The solvent media can for example be selected from the group of isopropanol, 2-methyl-2-butanol, 3-methyl-2-butanol, 2-pentanol, 3-pentanol, tertiary butanol, 1,1-dimethylpropanol and mixtures thereof. The process provides for obtaining high yields of pure product with the formation of a minimum of side reactions and by-products.

REISSUES

AUGUST 1, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

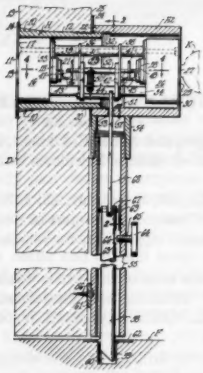
Re. 29,712
DOUBLE CYLINDER LOCK BOLT ASSEMBLY

Paul Shipman, 3835 Ridgeley Dr., Los Angeles, Calif. 90008

Original No. 3,964,281, dated Jun. 22, 1976, Ser. No. 562,631, Mar. 27, 1975. Application for reissue Mar. 28, 1977, Ser. No. 781,930

Int. Cl.[2] E05B *63/14*

U.S. Cl. 70—120 **14 Claims**



1. A lock assembly comprising in combination:

a pair of axially aligned, individually rotatable operating cylinders having means for selective anchorage spaced-apart opposite ends of a transverse bore of a closure, which closure carries a projectable lock bolt, [the adjacent inner ends of each cylinder carrying a generally diametricaly disposed contact surface projecting toward the adjacent spaced-apart cylinder and extending laterally to both sides of the common axis of said cylinders,]

arcuately reciprocable shift means for moving the lock bolt between alternate locked and unlocked positions, said means being located between the spaced-apart cylinders and having a coupling portion [arcuately] swingable [from a pivot point along] *in a direction transverse to* said common axis with the arcuate portion thereof disposed in operative connection with the lock bolt,

intermediate activating means connecting the inner end of each operating cylinder to the adjacent shift means therebetween, said activating means comprising a pair of [crank members each secured to a respective end of said shift means at points coaxial with and adjacent to a respective cylinder, each crank member having an arm laterally extending to one side of the common axis and disposed to contactingly overlie the adjacent contact-surface and thus to be turned by rotation of said surface, thereby] *lost-motion coupling elements each connected at one of its ends, for rotary movement by the inner end of a respective operating cylinder, and at its other end to said shift means thus enabling* arcuately moving the shift means plus its connected lock bolt between locked and unlocked positions in response to rotation of either operating cylinder.

Re. 29,713
ROTARY CUTTER DRUMS

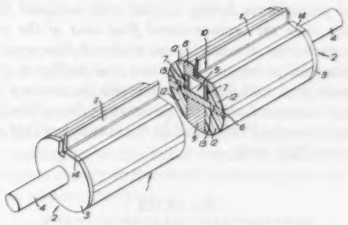
Richard Adrian Craddy, Alveston, England, assignor to Masson Scott Thrissell Engineering Limited, Bristol, Great Britain

Original No. 4,005,627, dated Feb. 1, 1977, Ser. No. 643,269, Dec. 22, 1975. Application for reissue May 27, 1977, Ser. No. 801,193

Claims priority, application United Kingdom, Jan. 17, 1975, 2077/75

Int. Cl.[2] B26D *1/36*

U.S. Cl. 83—674 **6 Claims**



1. A rotary cutter drum for use in apparatus for cutting continuous web material into discrete lengths including a load carrying member, means for attachment of a cutter blade thereto, and non-load carrying light-weight material secured to said load carrying member and so arranged that the whole forms a body whose outer surface is rotationally symmetrical, interrupted as necessary to allow for the presence of such cutter blade, in which means is provided on said load carrying member to balance said cutter blade and said attachment means.

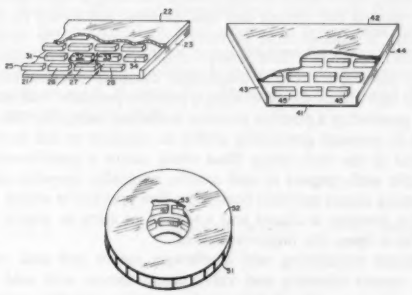
Re. 29,714
FLUID FLOW RESTRICTOR

Paul F. Hayner, Gilford, and Richard J. Brockway, Amherst, both of N.H., assignors to Sanders Associates, Inc., South Nashua, N.H.

Original No. 3,688,800, dated Sep. 5, 1972, Ser. No. 93,192, Nov. 27, 1970. Application for reissue Mar. 11, 1976, Ser. No. 665,989

Int. Cl.[2] F15D *1/02*

U.S. Cl. 138—42 **12 Claims**



1. A *low noise level* restrictor *having an inlet* for insertion in a fluid path for controlling the flow of fluid therethrough, comprising,

a plurality of spaced apart parallel impervious plates,
means for constraining fluid to flow between adjacent plates, *and*
a plurality of unconnected baffles between said plates, *each* in engagement with *both* facing surfaces of adjacent plates and arranged in rows transverse to the general direction of fluid flow, undeviating spaces between adjacent rows and spaces between adjacent baffles in each row as to define transverse passageways between rows and substantially straight longitudinal passageways between adjacent baffles in each row interconnecting adjacent transverse passageways,
the baffles in succeeding rows being positioned so as to divide the flow arriving from the spaces between adjacent baffles of the preceding row[.],
said restrictor having a first row of baffles at said inlet defining a first longitudinal set of passageways having a first total cross-sectional flow area and each succeeding row of longitudinal passageways having a total cross-sectional flow area greater than the cross-sectional flow area of the preceding row, such that the total cross-sectional flow area of said longitudinal passageways between said baffles at any given distance from said inlet increases with the distance from the inlet as measured along the direction of flow of fluid so as to reduce the noise level caused by the insertion of said restrictor into said fluid path.

Re. 29,715

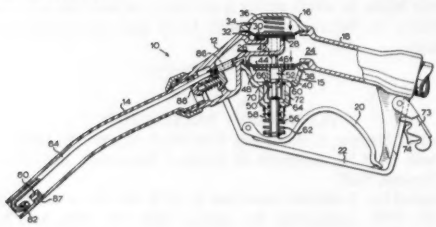
FLUIDIC AUTOMATIC NOZZLE

George B. Richards, 1212 Ranch Rd., Lake Forest, Ill. 60045; Leonard W. Swain, and Edward W. Hunter, both of London, Canada, assignors to George B. Richards, Lake Forest, Ill.

Original No. 3,866,637, dated Feb. 18, 1975, Ser. No. 329,226, Feb. 2, 1973. Application for reissue Feb. 16, 1977, Ser. No. 769,101

Int. Cl.[2] **B65B** *3/26*

U.S. Cl. 141—226 **17 Claims**



1. In an automatic nozzle for use in controlling the flow of fluids having a housing having a fluid passage opening therethrough, valve means in said passage including a valve member for opening and closing said fluid passage, and means for generating a positive fluid pressure in response to the flow of liquid through said fluid passage, diaphragm means mounted in said housing forming a diaphragm chamber communicating with said means for generating a positive pressure, said means for generating a positive pressure including means for disrupting its pressure generating ability in response to the level of liquid in the tank being filled rising above a predetermined height with respect to said nozzle, manually operable valve opening means movable between a first position in which said valve member is closed and a second position in which said valve is open, the improvement of

means connecting said diaphragm means and said valve means whereby said valve means moves with said diaphragm, and wherein said manually operable actuator means includes collapsible stem means extending into said housing and engaging said diaphragm means, locking means for releasably locking said stem means in an extended position in which said stem is operable to move said diaphragm to move said valve member to an open position,
and means urging said stem means to said first position to close said valve,
said releasable locking means being released when said stem means is moved to a predetermined position at least partially opening said valve and when said diaphragm chamber is positively pressurized at a pressure sufficient to move said valve closure member independently of said stem, thereafter said valve closure means being closable in response to a predetermined decrease in pressure by collapsing of said stem.

Re. 29,716

METHOD OF DRILLING A BOREHOLE USING GELLED POLYMERS

Richard L. Clampitt, and James E. Hessert, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Original No. 3,921,733, dated Nov. 25, 1975, Ser. No. 372,825, Jun. 22, 1973. Continuation-in-part of Ser. No. 224,914, Feb. 9, 1972, abandoned. Application for reissue May 23, 1977, Ser. No. 799,611

The portion of the term of this patent subsequent to Sep. 30, 1992, has been disclaimed.

Int. Cl.[2] **C09K** *7/00;* **E21B** *21/00, 43/22*

U.S. Cl. 175—65 **14 Claims**

1. In a method for drilling a borehole into the earth wherein a drill bit is actuated in said borehole and penetrates a subterranean formation in the presence of a drilling fluid, and said drilling fluid, together with formation solids entrained therein, is removed from said borehole, the improvement wherein said drilling fluid comprises an aqueous gel, and wherein said gel comprises water *having an initial total dissolved solids of not greater than about 40,000 ppm by weight* to which there has been added:

a water thickening amount of a water-dispersible polymer selected from the group consisting of: polyacrylamides and polymethacrylamides wherein up to about 75 percent of the carboxamide groups can be hydrolyzed to carboxyl groups; crosslinked polyacrylamides and crosslinked polymethacrylamides wherein up to about 75 percent of the carboxamide groups can be hydrolyzed to carboxyl groups; polyacrylic acid and polymethacrylic acid; polyacrylates, polymers of N-substituted acrylamides wherein the nitrogen atoms in the carboxamide groups can have from 1 to 2 alkyl substituents which contain from 1 to 4 carbon atoms; copolymers of acrylamide with another ethylenically unsaturated monomer copolymerizable therewith, sufficient acrylamide being present in the monomer mixture to impart said water-dispersible properties to the resulting copolymer when it is mixed with water, and wherein up to about 75 percent of the carboxamide groups can be hydrolyzed to carboxyl groups; and mixtures of said polymers;
a sensible amount of a water-soluble compound of a polyvalent metal wherein the metal present is capable of being reduced to a lower polyvalent valence state and which is sufficient to gel said water when the valence of at least a portion of said metal is reduced to said lower valence state; and
an amount of a water-soluble reducing agent which is effective to reduce at least a portion of said metal to said lower valence state.

Re. 29,717

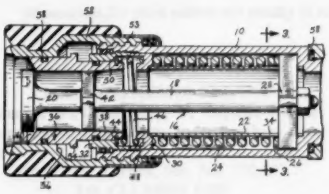
AUTOMATIC VOLUME ADJUSTING FIRE HOSE NOZZLE WITH FLUSHING MECHANISM

William S. Thompson, Elkhart, Ind., assignor to Elkhart Brass Manufacturing Co., Inc., Elkhart, Ind.

Original No. 3,893,624, dated Jul. 8, 1975, Ser. No. 508,064, Sep. 23, 1974. Application for reissue Mar. 25, 1976, Ser. No. 670,263

Int. Cl.[2] **B05B** *1/32, 15/02*

U.S. Cl. 239—107 **9 Claims**



1. In a fire hose nozzle including a tubular body part having an inlet end and an outlet end, a pressure responsive valve assembly shiftable in said body part and including a valve head and a valve stem, said valve head being shiftable toward and away from said body part outlet in response to variations in pressure of liquid supplied to said nozzle, the improvement comprising a barrel member having fore and aft ends surrounding said valve stem, the aft end of the said barrel member fitting slidably within the outlet end of said body part, said barrel member being shiftable longitudinally relative to said body part between a forward position in which the barrel member fore end spacedly encircles said valve head to define a liquid flow path from the nozzle and a rearward position in which the barrel member fore end is shifted rearwardly of the valve head to increase the spacing between the barrel member and valve head, a sleeve member encircling the fore end of said body part and surrounding said barrel member, means rotatably connecting said sleeve member to said body part wherein rotation of the sleeve member upon the body part causes the sleeve member to shift longitudinally of the body part between extended and retracted positions, said sleeve member including abutment part means for contacting said barrel member to shift the barrel member from its forward position into its rearward position as said sleeve member is shifted from its extended position into its retracted position.

Re. 29,718

RESILIENT MID-PITCH LUG FOR AN ENDLESS TRACK

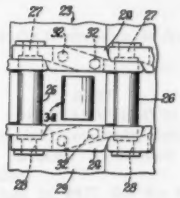
Harold L. Reinsma, Dunlap, and Frederick D. Proksch, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Original No. 3,887,244, dated Jun. 3, 1975, Ser. No. 420,720, Nov. 30, 1973. Application for reissue May 31, 1977, Ser. No. 801,716

Int. Cl.[2] **B62D** *55/08*

U.S. Cl. 305—57 **3 Claims**

9. In an endless track assembly of the type used on a vehicle provided with a drive sprocket having teeth and notches alternately disposed about the circumference of the sprocket, said track assembly comprising a pair of laterally upstanding link elements; [parrallel] *parallel* pin and bushing elements secured to and interconnecting respectively opposite ends of the links; a track shoe secured to the bottoms of said links; the improvement comprising a resilient impact lug in the form of a hollow, generally tubular body of synthetic plastic material substantially harder than natural rubber releasably secured to the shoe midway between the bushing elements, said tubular



body being provided with capping means at the contact end thereof and contains therewithin spring means biased between a pair of pressure plates secured within the body at opposite ends thereof, said impact lug having a topmost portion *of greater height from the track shoe than the topmost portion* of the adjacent bushings whereby initial contact is made by said lugs so that impact energy is absorbed by the lug prior to engagement of an adjacent bushing.

Re. 29,719

THERMOPLASTIC MOULDING COMPOSITIONS REINFORCED WITH A MIXTURE OF GLASS AND ASBESTOS FIBERS

George Leonard Wicker, Milnrow, England, assignor to T.B.A. Industrial Products Limited, England

Original No. 3,773,705, dated Nov. 20, 1973, Ser. No. 198,410, Nov. 12, 1971. Application for reissue Apr. 14, 1976, Ser. No. 677,031

Claims priority, application United Kingdom, Nov. 18, 1970, 54899/70; Dec. 10, 1970, 58746/70

Int. Cl.[2] **C08L** *77/00*

U.S. Cl. 260—37 N **5 Claims**

1. A *granular* thermoplastic *molding* composition, comprising (i) from 60 to 90 percent by weight of a thermoplastic polymeric material selected from the group consisting of polyolefins, polystyrene, polyamides, copolymers of butadiene, copolymers of acrylonitrile and copolymers of styrene; (ii) at least 10 percent by weight, based on the total weight of the composition, of a mixture of glass fibres and asbestos fibres in a weight ratio of from 1:0 11 to 1:9; and (iii) from zero to 20 percent by weight based on the polymeric material of a component selected from the group consisting of fillers and additives other than glass fibres and asbestos fibres; said ratio of glass and asbestos fibres [lending] *being selected to impart* synergistic properties to *an article injection molded from* the *granular* thermoplastic molding composition in at least one of the properties of tensile strength, flexural strength, tensile modulus and flexural modulus *of the article.*

PLANT PATENTS

GRANTED AUGUST 1, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,286

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Grantsville, W. Va., and William E. Duffett, Salinas, Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Nov. 5, 1976, Ser. No. 739,127
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium* plant known by the cultivar name Camino Pink and particularly characterized as to uniqueness by the combined characteristics of flat inflorescence form, daisy inflorescence type, lavender pink ray floret color with minimal color oxidation, uniform nine week flowering response, medium plant height, diameter across face of inflorescence up to 80 mm. at maturity, semi-upright branching pattern, and high percentage grade-out in top SAF grades.

4,287

CHRYSANTHEMUM

Nicolaas Middelburg, 's Gravenzande, Netherlands, assignor to Chrysanthemum Breeders Association N.V., Willemstad, Netherlands Antilles

Filed Aug. 26, 1977, Ser. No. 828,259
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of chrysanthemum, substantially as described and pictured herein, characterized by its satiny golden blooms, vigorous growth, three month response and permanence.

4,288

CHRYSANTHEMUM

Nicolaas Middelburg, 's Gravenzande, Netherlands, assignor to Chrysanthemum Breeders Association N.V., Willemstad, Netherlands Antilles

Filed Aug. 29, 1977, Ser. No. 828,501
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of chrysanthemum, substantially as described and pictured herein, characterized by its satiny pink blooms, vigorous growth, three month response and permanence.

PATENTS

GRANTED AUG. 1, 1978

ERRATA

For CLASS	See PATENT NO.
028–173	4,103,390
066–192	4,103,485
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214–086 A	4,103,799
138–145	4,103,800
214–001 HA	4,103,831
366–178	4,103,876
272–077	4,103,889
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071–107	4,104,043
062–324	4,104,044
204–181 R	4,104,100
209–074 R	4,104,156
521–032	4,104,204
521–084	4,104,207
521–053	4,104,208
521–062	4,104,209
528–102	4,104,257
528–334	4,104,258
528–169	4,104,259
528–323	4,104,260
528–295	4,104,262
528–279	4,104,263
528–370	4,104,264
528–046	4,104,265
528–289	4,104,297
264–089	4,104,394
264–060	4,104,395
428–035	4,104,404
235–064.7	4,104,510
235–132 R	4,104,511
364–439	4,104,512
235–450	4,104,513
235–466	4,104,514
235–488	4,104,515

PATENTS

GRANTED AUGUST 1, 1978

GENERAL AND MECHANICAL

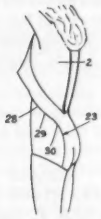
4,103,359
NOISE SUPPRESSING WELDING HELMET
Perry J. Rieppel, Worthington, and Harold Richard Henderson, Lancaster, both of Ohio, assignors to Arcair Company, Lancaster, Ohio
Filed Feb. 28, 1977, Ser. No. 773,633
Int. Cl.[2] A61F *9/06*
U.S. Cl. 2—8 **11 Claims**

1. In a welder's helmet of the type having a front section containing a light filtering glass window and oppositely disposed rearwardly extending sides supported by a head harness for positioning the helmet to protect the face and sides of a welder's head when the helmet is worn during a welding operation, the improvement comprising:

a forward extending recess in each of said sides, said recess sized to be larger than the area covering a welder's ears;

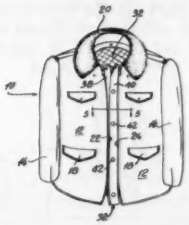
ear protection means including an acoustical absorbing medium covering said recesses and extending rearwardly therefrom, said means and acoustical medium being disposed in said recesses so that when said helmet is being worn, neither said means nor said acoustical absorbing medium touches the ears of the user/welder.

4,103,360
WOMAN'S GARMENT WHICH MOLDS THE UPPER BODY
Charles Belpaume, Bouc Bel Air, France, assignor to Baron Chalmalla SA, Fribourg, Switzerland
Filed Jun. 27, 1977, Ser. No. 810,275
Claims priority, application France, Jun. 25, 1976, 76 19315
Int. Cl.[2] A41D *5/00*
U.S. Cl. 2—67 **5 Claims**



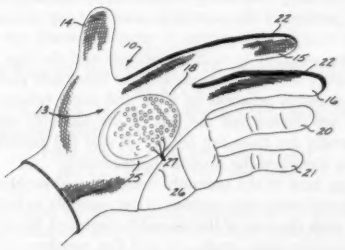
1. Woman's garment, and more particularly a garment which moulds the upper body such as a one-piece bathing costume, an all-body-tight garment, a leotard, a blouse of the type closing between the legs, the said garment having seams which extend continuously from its upper edge to its lower edge characterised in that it has two lateral seams symmetrical in relation to the vertical plane of symmetry of the body, and each seam following, downwardly, a path such that it crosses the breast while passing substantially over the nipple region and while forming by a first contour a housing for the breast, and such that it crosses the side in order to be directed downwards and outwards towards the iliac crest then downwards and backwards to the level of the sacral promontory, and finally such that it crosses the gluteal muscles to extend at least as far as the gluteal fold while forming by a second contour, a housing for the buttock.

4,103,361
OUTERWEAR
Hyman Carmen, St. Laurent, Canada, assignor to Evin Industries Ltd., Montreal, Canada
Filed Jun. 27, 1977, Ser. No. 810,395
Claims priority, application Canada, Jun. 7, 1977, 280067
Int. Cl.[2] A41D *1/00*
U.S. Cl. 2—97 **6 Claims**



1. Outerwear including an outer shell and an inner shell, the outer shell and inner shell each having front edges, the inner shell having fastening means spaced from its front edges adapted to engage with similar fastening means on the front edges of the outer shell so as to provide a panel extending beyond the front edges of the outer shell, closure means provided on the panel for effectively closing the assembled outerwear jacket, whereby the inner girth of the outer shell when worn independently of the inner shell is equal to the inner girth of the composite outerwear when the inner shell is provided in the outer shell such that the overall girth of the composite outerwear has been expanded.

4,103,362
BILLIARD GLOVE
Carl E. Blakeman, 6001 Downey Ave., Long Beach, Calif. 90805
Filed Oct. 7, 1976, Ser. No. 730,445
Int. Cl.[2] A41D *19/00*
U.S. Cl. 2—161 A **7 Claims**



1. An apparatus for facilitating the sliding movement of a billiard cue relative to the guide hand of a billiard player comprising a covering formed to encompass the knuckles of the

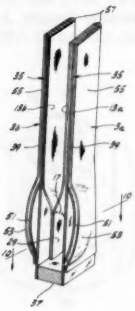
thumb, index finger and middle finger of said guide hand and to encircle said guide hand and having expansive surfaces constructed to soft, porous fabric to reduce friction with respect to a billiard cue sliding thereover and including a releasable fastening strap and wherein the ring finger and little finger of said guide hand protrude freely from said covering.

4,103,363

METHODS OF MANUFACTURING PANTS

William R. Conner, Jr., Shelbyville, Tenn., assignor to Stahl-Urban Company, Brookhaven, Miss.

Filed Aug. 9, 1976, Ser. No. 712,711
Int. Cl.[2] A41D *1/07, 27/00*
U.S. Cl. 2—227 **13 Claims**



1. The method of making a pair of pants comprising assembling component parts to form the legs and the upper part of the pants, one end of the resultant assembly constituting its waist end, each component part being of heat-settable textile material;

applying the assembly to a molding form having a hip section for molding the outer side portions of the assembly adjacent its waist end to conform to the shape of the torso at the hips and leg portions extending from said hip section, said hip section being shaped to conform to the hip portion of the human figure and the leg portions comprising flat members extending from the hip section generally in front-to-rear vertical central leg planes on opposite sides of the front-to-rear vertical central plane of the hip section, said flat members extending for a distance corresponding to the length of the legs of said assembly and having a width greater than the width of the legs of said assembly generally at all points along the length of said flat members for stretching each leg girthwise generally throughout the length, said applying of the assembly to said molding form being carried out by drawing the waist end portion of the assembly over said leg portions and then over said hip section to apply said waist end portion of the assembly to said hip section and the legs of said assembly to said flat members, the outer side portions of the assembly adjacent its waist end being bulged out by said hip section and the legs of the assembly extending generally for their full length on said flat members and being stretched flat on said flat members;

applying heat to the assembly while on said molding form with said outer side portions of the assembly so bulged out and with the legs of the assembly stretched flat generally throughout their length on said flat members to set the assembly with said outer said portions of the assembly so bulged out and with said legs of the assembly having pants leg creases; and

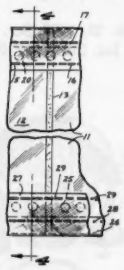
removing the assembly from the molding form.

4,103,364

VENTED WATERPROOF PANTS

Burch O. Gustafson, 2677 S. Shore Blvd., White Bear Lake, Minn. 55110

Filed Nov. 1, 1976, Ser. No. 737,383
Int. Cl.[2] A41B *9/04*
U.S. Cl. 2—406 **7 Claims**



1. Baby pants having a main body section of waterproof material that has front and rear panels, said panels each having an interior surface, an exterior surface, a top waist opening terminal edge, a first leg opening edge, a second leg opening edge, a first side edge extending longitudinally between the top edge and the first leg edge, a second side edge transversely opposite the first side edge extending between the top edge and the second leg edge, and a crotch area between the leg opening edges, the first and second panels being joined together along the lengths thereof adjacent their first side edges and also joined together along the length thereof adjacent their second side edges, at least one of said panels having a first row of vent apertures adjacent to and extending along one of the opening edges from adjacent one of the first and second side edges toward the other of the first and second side edges, and terminating remote from the said other of the first and second side edges, the vent apertures being in direct air flow communication with the interior of the pants and remote from the crotch area when the pants are in a normal condition of use, an open mesh band extending over the apertures, an elastic waistband adjacent the top edges, an elastic first leg opening band adjacent the first leg opening edge, an elastic second leg opening band adjacent the second leg opening edge, first means for securing the open mesh band and the elastic band that is adjacent to the same opening edge that the apertures are adjacent to the main body section with the apertures more remote from the last mentioned opening edge than the last mentioned elastic band, and second and third means for respectively securing the two elastic bands other than said last mentioned elastic band to the main body adjacent the respective one of the two opening edges other than the one the apertures are adjacent to.

4,103,365

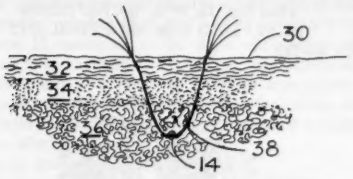
METHOD OF IMPLANTING SYNTHETIC HAIR

George D. J. Applegate, 9526 E. Harrison Cir., Tucson, Ariz. 85710

Filed Jul. 6, 1976, Ser. No. 702,415
Int. Cl.[2] A61F *1/00*
U.S. Cl. 3—1 **12 Claims**

1. A method for implanting synthetic hair fiber into living skin tissue comprising the steps of attaching synthetic hair fiber to a needle; tying at least one knot in the synthetic hair fiber; passing the needle under the skin tissue into the subcutaneous tissue layer such that separate entrance and exit points are made; drawing the synthetic fiber through the skin tissue;

leaving the portion of the synthetic fiber having the knot under the skin; and separating the needle from the synthetic fiber



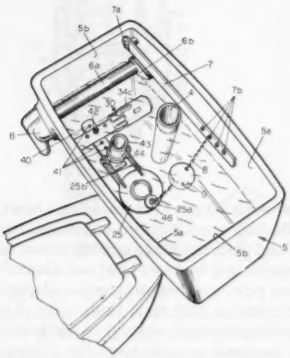
whereby the synthetic fiber emerging from the skin tissue creates the appearance of living hair.

4,103,366

REPLACEMENT VALVE ASSEMBLY FOR FLUSH TANK TOILETS

John La Tour, Jr., 124 Emmett St., Daytona Beach, Fla. 32014

Filed Sep. 8, 1976, Ser. No. 721,246
Int. Cl.[2] E03D *1/34*; F16B *7/10*
U.S. Cl. 4—393 **1 Claim**



1. A replacement flush valve assembly for a toilet having a flush tank which has generally parallel, spaced vertical side walls, vertical end walls and a bottom and a discharge pipe protruding upwardly through the bottom with an annular, planar seat on its upper end, said assembly comprising:

(a) a flapper valve adapted to sealingly fit over said seat, said valve having
  (1) a disc-like body and
  (2) spaced apart pivot arms extending outwardly from said body,

(b) and means for mounting said valve member for angular movement between a raised position spaced above said seat and a closed position sealingly overlying said seat, said mounting means comprising
  (1) an axially extendible support adapted to be positioned horizontally in said tank with its ends tightly engaging said side walls, said support having a plurality of axially spaced apertures extending therethrough
  (2) means for locking said support in its extended position with the apertures extending generally vertically,
  (3) an elongated support bar having a plurality of longitudinally spaced apertures,
  (4) a post extending upwardly of said bar,
  (5) a resilient ring adapted to embrace said post frictionally for slidable movement therealong, said ring having radially protruding pivots adapted for pivotal engagement with the free ends of said valve pivot arms, and
  (6) a fastener adapted to extend through a selected pair of the apertures in said support and in said bar for fastening said bar to said support at a position in which said bar extends laterally from said support toward said discharge pipe seat with said post extending vertically relative to said support bar to place said flapper valve in a position overlying said seat,

said extendible support comprising first and second telescoping tubular elements having mutually engageable threaded portions, a rod adapted to be inserted into the open end of the second of said tubular elements, and compressable friction pads at the outer ends of the first of said tubular elements and said rod,

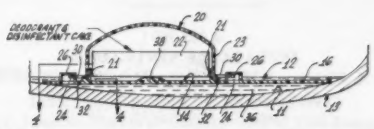
said support locking means comprising a pin having a radially extending projection on its medial portion and adapted to extend through diametrically aligned apertures in the wall of the second of said tubular elements adjacent the inner end of said rod for rotation between a locked position with said projecting medial portion in engagement with the inner end of said rod thrusting said rod axially to tightly lock said support in position and an unlocked position with the pin rotated out of disengagement with said rod.

4,103,367

CHEMICAL DISPENSER FOR URINALS

Leo Kaufer, 14144 Dickens St., Sherman Oaks, Calif. 91423

Filed Mar. 30, 1977, Ser. No. 782,948
Int. Cl.[2] E03D *9/02*
U.S. Cl. 4—222 **5 Claims**



1. A dispensing container for solid deodorant and/or disinfectant media, for use in urinals, which comprises:

a generally flat plate having a perforate central portion and a perforate peripheral portion;

an imperforate cover adapted to contain therewithin said solid media and being provided with a peripheral flange therearound;

cooperating fastening means on said imperforate cover and said plate for releasably engaging said imperforate cover with said plate in overlying relationship with said perforate central portion of said plate; and

lug means affixed to said plate and lying in abutment with said peripheral flange of said cover thereby prevening abutment of said cover to said plate and forming a substantially continuous peripheral channel immediately adjacent and below said cover whereby the flush water path includes passage of flush water from the underside of the plate upwardly through the central porforate portion thereof, into the interior of the imperforate cover, and outwardly through the peripheral channel formed immediately below said cover.

4,103,368

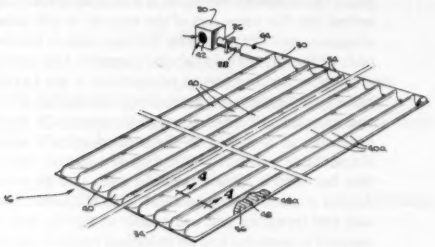
POOL COVER HAVING SOLAR ENERGY HEATING FEATURE

James J. Lockshaw, Huntington Beach, Calif., assignor to Tolo, Incorporated, Santa Ana, Calif.

Filed Jul. 12, 1976, Ser. No. 704,301
Int. Cl.[2] E04H *3/19*; F24J *3/02*
U.S. Cl. 4—172.12 **19 Claims**

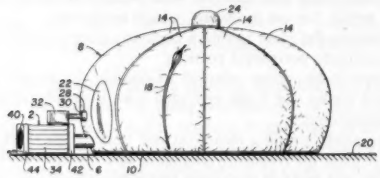
1. In a cover for a swimming pool adapted to furling about a storage locus and alternatively to planar deployment for use, said cover comprising flexible, water resistant sheet material, biasing means comprising a plurality of spaced parallel spring fingers carried by the cover and normally coiled to resiliently exert a furling bias continuously against said cover into furled position about said locus, and inflatable structure responsive to

inflation to overbalance said bias and deploy said cover into use position thereby, said inflatable structure comprising a series of hollow, solar radiation transparent ribs extending parallel to each other and to said spring fingers and normal to



said storage locus, said cover including a wall portion underlying said inflatable structure in solar radiation receiving relation partially defining water conduit means and responsive to solar radiation reception to heat water in contact therewith.

4,103,369
INFLATABLE STRUCTURE
David B. Riordan, 3115 Eton Ave., Berkeley, Calif. 94705
Filed Feb. 28, 1977, Ser. No. 772,452
Int. Cl.[2] E04H *3/16, 3/18*
U.S. Cl. 4—172.12 **12 Claims**



1. A portable, self-ventilating inflatable enclosure assembly for providing a separate, completely enclosed space, defined by the interior of the enclosure, within a room, comprising

an enclosure floor portion of flexible sheet material for contacting the surface supporting the structure, the periphery of said floor portion defining the base of said enclosure,

an enclosure upper portion of flexible sheet material attached to said floor portion adjacent said floor portion periphery, the space between said floor portion and said upper portion defining the interior space of the enclosure,

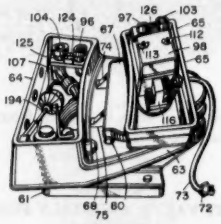
blower means for supplying air at a predetermined rate at greater than ambient pressure to fill said enclosure interior space therewith, whereby the enclosure may be inflated,

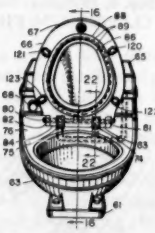
conduit means joining said blower means to said enclosure interior for introduction of said supplied air into said interior,

vent means positioned adjacent the attachment of said upper portion to said floor portion providing for automatic venting of said supplied air from said enclosure interior space at a predetermined rate after said enclosure is fully inflated, and

a carrying case containing said blower means and into which said floor portion, upper portion, conduit means and vent means are insertable for carrying when the enclosure is deflated.

4,103,370
ODORLESS WATER CLOSET
Douglas L. Arnold, 111 Sorento Dr., Holland, Mich. 49423
Filed Sep. 13, 1976, Ser. No. 722,696
Int. Cl.[2] E03D *9/04;* **A47K** *13/00, 3/22*
U.S. Cl. 4—213 **4 Claims**





1. An odorless water closet including a bowl, a tank having a cover, flushing conduit means communicating between said bowl and said tank, discharge conduit means including a trap, and communicating with said bowl and adapted for connection to a sewage pipe, water-control means adapted to control the supply of water to said tank, flush valve means adapted to discharge the contents of said tank to said bowl, and seat means pivotally mounted on said bowl for movement between a horizontal position over said bowl and an elevated substantially vertical position normally at the rear of said bowl and adjacent said tank, and also including ventilating means adapted to exhaust gases from within said bowl, wherein the improvement comprises:

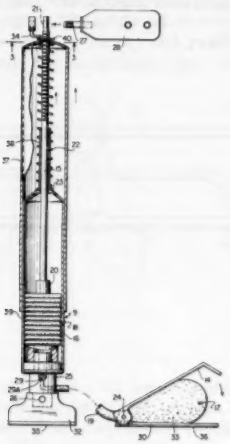
an intake manifold disposed and mounted on the underside of said seat and adjacent the periphery of said bowl, and an intake conduit extending from said intake manifold; and

an exhaust conduit communicating between said intake conduit and said discharge conduit within said tank on the opposite side of said trap from said bowl, said exhaust conduit including blower means adapted to induce flow in said exhaust conduit toward said discharge conduit, and also including one-way valve means, said exhaust conduit also including a tubular member forming a pivotal mounting for said seat, and further including hollow bracket means mounted on said bowl and supporting said tubular member, said bracket means having a tubular vertical portion traversing a portion of said bowl.

4,103,371
TOILET SEAT LIFT
Lester J. Wilson, R.D. 3, Cambridge Springs, Pa. 16403
Filed Dec. 14, 1976, Ser. No. 750,424
Int. Cl.[2] A47K *13/10;* **E05F** *13/00;* **F16J** *3/06*
U.S. Cl. 4—251 **1 Claim**

1. In combination, a toilet having a seat **11** and a cover **12**, hinge means **41** connecting said seat **11** to said toilet **1**, bulb means **17** to be engaged by a person's foot for operating said toilet seat **11**,

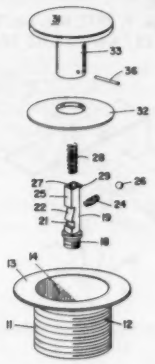
a rod **15** pivotally connected to said seat in a position spaced from said hinge means,
a hollow cylinder supported relative to said toilet at one end,
a bellows-like member **18** in said hollow cylinder **9** having said rod **15** connected to the upper end thereof **20** and adapted to be expanded by fluid from said bulb means **17**,
said bulb means **17** comprising a hollow expandable bulb connected to said bellows-like member for forcing air into said bellows-like member whereby said rod swings said seat to lifted position,
a C-shaped washer on an end of said rod,
spaced grooves in said rod receiving said washer,
a cylindrical dust cover telescopically received on said cylinder,



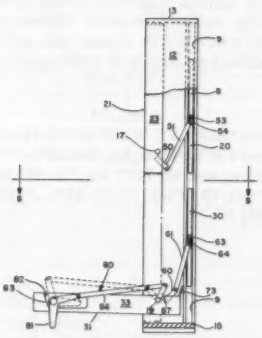
a helical spring supported on said rod,
one end of said helical spring resting on said cylinder and the other end of said spring supported on said dust cover urging said rod and said seat upward to counterbalance said seat,
said rod having longitudinally-spaced grooves,
said C-shaped washer being selectively received in said longitudinally-spaced grooves in said rod whereby said seat is counter-balanced to swing upwardly,
and said spring extending through the inside of said dust cover and engaging the top of said dust cover for urging said rod upwardly.

4,103,372
POP UP DRAIN FITTING
Casper Cuschera, 800 Durham Rd., Fremont, Calif. 94538
Filed Feb. 28, 1977, Ser. No. 773,138
Int. Cl.[2] A47K *1/14;* **E03C** *1/26*
U.S. Cl. 4—286 **1 Claim**

1. In a drain valve including a drain body having a flow channel therethrough and a post extending azially through said flow channel, and a drain sealing cover provided with a tubular portion having a central passage receiving said post for slidable translation thereabout and radial clearance therefrom, detent means in one axially extending surface of said post for selectively securing said post and said tubular portion with said drain sealing cover sealing said flow channel, said detent means being disengageable by rocking said tubular portion about the upper end of said post, the improvement comprising first compression spring means for biasing said drain sealing cover upwardly to clear said flow channel; and resilient means for biasing said tubular portion radially to oppose said rocking disengagement of said detent means, said resilient means including a hole extending radially into said post, the opening of said hole being in opposed relationship to said one axially extending surface, a detent member disposed in said hole, and second compression spring means for biasing said detent member into impingement with said central passage of said tubular member.



4,103,373
PORTABLE FOLDING BED CABINET
Oscar F. Luedtke, and Sarah Luedtke, both of 1636 Jasper Ave., Chula Vista, Calif. 92011
Filed May 5, 1977, Ser. No. 793,916
Int. Cl.[2] A47C *17/40*
U.S. Cl. 5—166 R **7 Claims**



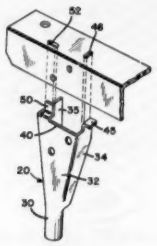
1. A portable folding bed cabinet comprising:
a vertically elongated frame;
at least one mattress frame;
means pivotally attaching said mattress frame to said vertically elongated frame:
counterweight means connected to said mattress frame;
said vertically elongated frame comprising a pair of vertical side frame members connected together by a top frame member, said vertical side frame members having track means along their innersurfaces for guiding said counterweight means as they are raised and lowered when said mattress frame is pivoted from a vertical position to a horizontal position; and
said counterweight means being elongated panels that extend across the back of said vertically elongated frame with their ends inserted into said track means.

4,103,374

BED FRAME LEG CONSTRUCTION

Silas J. Knoke, Seymour, Ind., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Apr. 7, 1977, Ser. No. 785,583
Int. Cl.[2] A47B *19/02, 19/04*
U.S. Cl. 5—176 R **3 Claims**



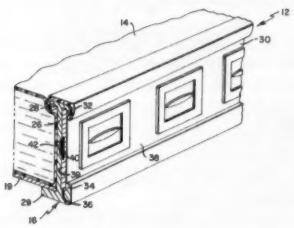
1. In a folding bed frame having an angle iron end rail pivotally attached in underlying relation to a side rail for movement between a folded position in which the end rail is adjacent to the side rail and an erected position in which the end rail is normal to the side rail, and in which said end rail has a horizontal flange and a vertically depending flange, the improvement in frame supporting structure comprising, a sheet metal support leg having a castor-receiving socket portion at the bottom flaring into a generally flat tapered back wall and a pair of laterally-extending side walls, said back wall being received against an inside surface of the depending flange of said end rail, said side walls tapering from said socket portion upwardly to the top of said leg, rivet means extending through said back wall and said depending side rail flange fixing said back wall in abutment with the inside surface of said depending flange, said back wall being provided with an inwardly and upwardly extending stop member, and slot means in said horizontal flange receiving said stop member therethrough, said stop member being positioned to engage said side rail when the associated end rail is positioned in right angled relation thereto.

4,103,375

DECORATIVE WATERBED FRAME

Philip J. Santo, 130 Larkspur La., Rochester, N.Y. 14622

Filed Jun. 10, 1977, Ser. No. 805,583
Int. Cl.[2] F16B *12/00;* **A47C** *27/08*
U.S. Cl. 5—282 R **8 Claims**



1. A decorative frame of modular construction for supporting the perimeter of a mattress such as a flexible bladder for a waterbed, said decorative frame comprising:

a plurality of upstanding elongated wall members of uniform cross-sectional configuration, said wall members having channel means formed along the longitudinal marginal edges thereof;

a plurality of decorative panels supported in said channel means of said plurality of wall members respectively;

means for releasably fastening a decorative panel to a respective wall member within the channel means thereof;

a plurality of corner members of uniform configuration, said corner members interconnecting adjacent wall members at right angles, whereby a support frame for the perimeter of the waterbed mattress is formed; and

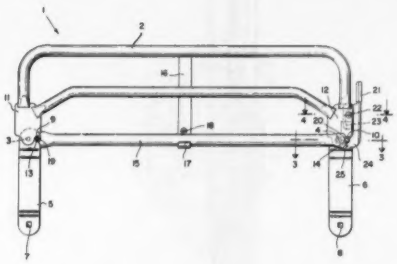
a plurality of decorative panels releasably fastened to said plurality of corner members respectively.

4,103,376

SAFETY SIDE FOR HOSPITAL BED

Roland A. Benoit, and Edmund P. Guillot, both of Danielson, Conn., assignors to InterRoyal Corporation, New York, N.Y.

Continuation of Ser. No. 626,798, Oct. 29, 1975, abandoned.
This application Mar. 29, 1977, Ser. No. 782,485
Int. Cl.[2] A47C *21/00*
U.S. Cl. 5—331 **9 Claims**



1. Safety side apparatus for a hospital bed comprising:

a longitudinally extending rigid side frame having a pair of longitudinally spaced apart fixed distance pivot locations thereon,

a pair of longitudinally spaced apart crank levers, each adapted to be mounted operatively at one portion thereof on the bed and each having a floating frame pivot point and a biasing crank pivot point radially spaced from the frame pivot point at another portion thereof spaced from the first portion thereof,

the frame being pivotally connected at the fixed pivot locations thereon to the levers at the corresponding frame pivot points of the levers to move the frame from a lower position to an upper position with respect to the bed,

intermediately disposed retaining means on the frame, and

a bilateral longitudinal resilient biasing member operatively mounted intermediate its ends on the frame by the retaining means and operatively connected at its ends to the levers at the corresponding biasing crank pivot points and arranged with respect to the levers for bending the bilateral member out of its normal longitudinal disposition as the levers rotate about the floating frame pivot points with respect to the frame at the fixed distance pivot locations thereon to move the frame from the upper position to the lower position against the resilient force of the bilateral member exerted on the levers operatively connected to the ends of the bilateral member at the biasing crank pivot points and which force normally urges the frame pivot points of the levers and in turn the frame at the fixed distance pivot locations thereon to the upper position.

4,103,377

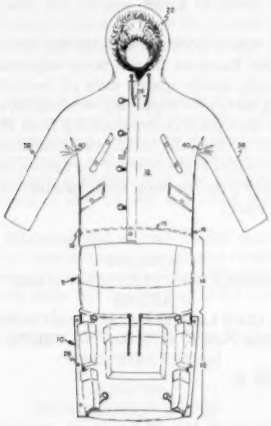
KNAPSACK-PARKA SLEEPING BAG

James W. Mayer, and Albert G. Smart, both of Santa Fe, N. Mex., assignors to Mel A. Pfreizer, Santa Fe, N. Mex.

Filed Jan. 27, 1977, Ser. No. 763,035
Int. Cl.[2] A47G *9/08*
U.S. Cl. 5—343 **3 Claims**

1. A sleeping bag comprising in combination, a parka and a

knapsack, said knapsack having a substantially rectangular hollow bag-shape lower closed end portion formed by shape defining insulating lateral walls and an insulating bottom wall, a pair of flanges attached to and extending colinearly outwardly from and in the plane of one of the lateral walls whereby the knapsack lower end portion is adapted to be secured to and carried on a backpack frame; a substantially limp elongated insulating tube portion connected at one end to the open end of the knapsack closed end portion whereby it forms when in extended condition, a tubular insulating extension thereof, the combined length of the knapsack closed end portion and the tubular extension, (when extended,) being adequate to house the body of the user from feet to (hips) — a lower portion of said parka — substantially, and the combined lengths of the knapsack closed end portion and the tubular extension when compacted being that of the knapsack closed end portion substantially; (a parka,) said parka comprising inner and outer walls and an insulating layer therebetween,



detachable fastening means comprising two elongated coextensive cooperative elements, means affixing one of said cooperative elements to the inner wall of the parka parallel to the bottom edge thereof and spaced from said bottom edge by the width of a depending parka flap portion, and the other cooperative element of the detachable fastening means being attached to the free end of the knapsack limp tube portion around all the peripheral extent thereof, the inside transverse peripheral extent of the parka when closed at the location of the detachable fastening means being equal to the peripheral extent of the free end of the knapsack limp tube portion, whereby said fastening means is adapted to detachably fasten the open end of the knapsack insulating tube portion throughout its peripheral extent to the inside wall of said parka to form a draft proof junction, the flap portion of said parka covering the fastening means to thermally insulate the fastening means, and the junction between parka and knapsack elongated insulating tube portion.

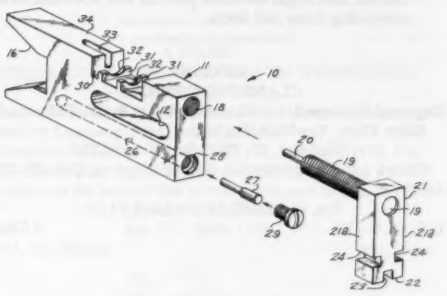
4,103,378

PORTABLE-THREE-IN-ONE BICYCLE TOOL

Javier F. Granados, 204 E. 1st Pl., Kennewick, Wash. 99336

Filed Aug. 8, 1977, Ser. No. 822,930
Int. Cl.[2] B25F *1/00*
U.S. Cl. 7—138 **5 Claims**

1. A portable three-in-one bicycle tool, comprising an elongated main body of rectangular cross-sectional configuration, a cut-out portion in one end of said main body providing a means of trueing a wheel of a bicycle, a threaded bolt and wing nut fastener removably securing said main body to a bicycle, a handle with spoke adjustment means and a shaft means for adjusting and fixing a bicycle chain, received removably in said



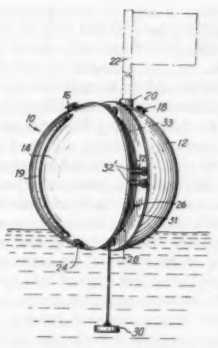
main body, and a chamber within said main body for storing rivet extractor tips.

4,103,379

MARKER BUOY

Henry S. Wolfe, Clearwater, Fla., assignor to American Clearwater Corp., Clearwater, Fla.

Filed Sep. 9, 1977, Ser. No. 831,941
Int. Cl.[2] B63B *21/52*
U.S. Cl. 9—8 R **8 Claims**



1. A marker buoy for marking a selected location on the surface of a body of water having a particular depth at said location, said marker buoy comprising:

a body portion of buoyant material operative to float said buoy on said water surface, said body portion being free to rotate on said water's surface about an axis substantially parallel to said surface;

a core portion centrally disposed in said body portion, said core portion having a central hub and opposed sidewalls overextending said hub to define an annular recess about the periphery of said marker buoy, the axis of said hub being substantially coincident with the rotational axis of said body portion;

an anchor line for winding and unwinding movement within said recess about said hub when one end of said line is fixedly secured to said marker buoy, the other end of said line being free to engage an anchor weight operative to sink in said body of water and to unwind said line until a length of said line corresponding to said particular depth is unwound to anchor said marker buoy; and

a plurality of resilient finger elements each being fixedly mounted at one end to one of said core portion sidewalls and extending across said recess towards the opposite sidewall;

whereby when said anchor weight is secured to said free end

of said line and descends in said water and unwinds said line to anchor said buoy, said line is pulled against said successive finger elements, and after said buoy is anchored, said finger elements prevent said line from further unwinding from said buoy.

4,103,380

CLAMPING DEVICES

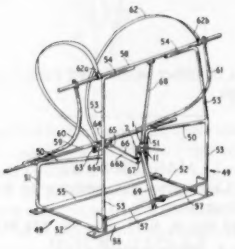
Raymond Richmond, c/o Thornton, Baker & Co., Eldon Lodge, Eldon Place, Bradford, England

Filed Oct. 27, 1976, Ser. No. 735,915

Claims priority, application United Kingdom, Oct. 29, 1975, 44521/75

Int. Cl.[2] B63B *23/00*; A44B *11/10*

U.S. Cl. 9—30 **9 Claims**



1. In combination, a support arrangement for a floatation device and a clamping device, said support device comprising a frame for supporting the floatation device, a restraining sling for restraining the floatation device on the frame and a lever pivotally attached to said frame and having one free end detachably engageable with said restraining sling and its other end supportable by the clamping device, said clamping device comprising a co-operating element, attached to that end of said lever remote from said end detachably engageable with said restraining sling, having an aperture therethrough, a U-shaped clamping member, defined by a base with two spaced apart limbs integral with said base, mounted on said co-operating member with the said base located in said aperture and said limbs passing one on each side of the said co-operating member, first apertures in the free ends of said limbs, second apertures in said limbs between said first apertures and said base, a flexible adjustable length member having one end passing through said first apertures in both said limbs and secured to retain said end with said limbs, said flexible adjustable length member extending from said end around a fixed part of said frame and then back to the clamping device to pass through said second apertures in said limbs whereby a section of said flexible adjustable length member lies between said co-operating element and said base, and a quick release element associated with the said clamping member and actuable to displace the said clamping member relative to the co-operating element in the direction to increase the distance between the said base and said co-operating member.

4,103,381

HYDRAULIC MOTOR

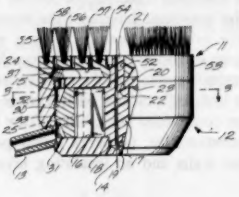
Otto W. Schulz, San Diego, Calif., and Tor Jan Pedersen, Hellandsbygd, Norway, assignors to Randolph C. H Michaelson, Malibu, Calif.

Filed Aug. 12, 1977, Ser. No. 824,057

Int. Cl.[2] A46B *13/06*

U.S. Cl. 15—29 **7 Claims**

1. A hydraulic motor in which a circular sliding-vane rotor is centrally disposed in a substantially elliptically cylindrical rotor chamber formed in a body to which the rotor is rotatably mounted to define a pair of diametrically opposed arcuate work cavities to each of which a working liquid is introduced under pressure via an inlet port and from which spent liquid is withdrawn via an exit port displaced angularly from the inlet port in the direction of rotation of the rotor, the rotor carrying a sufficient number of radially movable spring-biased vanes slidably engaging the walls of the chamber that at least one vane is always disposed in cavity-dividing position in each cavity for application thereto of pressure of liquid in the cavity between the vane and the inlet port, thereby to urge the vane toward the outlet port and to turn the rotor about an axis of rotation thereof, and characterized in that the body defines a



pair of annular spaces concentrically of the rotor chamber at axially displaced locations in the body adjacent the corresponding opposite axially spaced ends of the rotor chamber, and comprising means for supplying working liquid to one of the spaces, the inlet ports communicating from the one space to the respective cavities, the outlet ports communicating from the respective cavities to the other of the spaces, and means for discharging liquid from the outer space substantially parallel to the axis of the rotor.

4,103,382

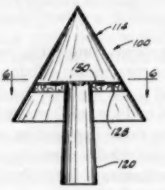
ADHESIVE DEVICE FOR CLEANING HARD TO REACH AREAS

Jeffrey J. Gitt, 13368 LaBarge Dr., St. Louis County, Mo. 63141

Filed Nov. 8, 1976, Ser. No. 740,178

Int. Cl.[2] A47L *13/00*

U.S. Cl. 15—104 R **2 Claims**



1. A disposable cleaning device for connection to a conventional broom handle comprising:

a hollow conical member having a solid exterior surface contiguous with the apex thereof and formed from a single paper blank;

said conical member including a tacky substance means on the exterior surface thereof for holding debris thereon;

a paper, circular disk having a peripheral, crimped, depending skirt adhesively connected to the interior surface of said conical member and positioned coaxially therewith;

said disk having a central passageway therethrough;

a paper tubular stem member passing through said passageway;

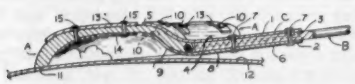
said stem member including a plurality of integral tab members at the inner end thereof, and said tab members being bent radially outwardly with respect to said stem member and being secured to said disk;

said conical member having an apex angle of less than 90°;

said tubular stem member being tapered toward said conical member and having decreasing inside diameters from the outer end to said inner end thereof, and the range of said inside diameters being such that conventional broom

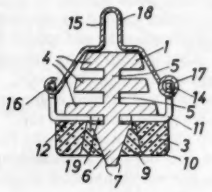
handles will frictionally engage the interior of said stem member at some degree of axial insertion of such broom handle within said stem member.

4,103,383
SNOW DRAG AND SCOOP
Alice I. Martin, 1001 E. 5th, Long Beach, Calif. 90802
Filed Apr. 29, 1977, Ser. No. 792,266
Int. Cl.[2] A47L *1/06*; A01B *1/22*
U.S. Cl. 15—245 **2 Claims**



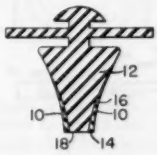
1. A device of the type described comprising:
(a) a pneumatic tire carcass sector of about one-half the width of a cross section through the carcass and having a length extending substantially through a one hundred and twenty degree arc;
(b) a handle;
(c) a holder interconnecting the handle to the inner arcuate edge of the tire carcass and at the midpoint of this edge, said holder consisting of two complemental parts forming a ferrule secured to said handle and having two arcuate-shaped portions engaging with the adjacent outer and inner surfaces of said carcass and being secured to said carcass;
(d) radially extending and arcuate-shaped reinforcing pairs of strips, the outer strips contacting and conforming to the outer surface of said carcass, and the inner strips underlying the outer strips and conforming to the inner surface of said carcass; and
(e) means for securing the pairs of strips to the carcass.

4,103,384
WINDSHIELD WIPER
Wolfgang Priesemuth, Postkamp 13, 221 Itzehoe-Nordoe, Fed. Rep. of Germany
Division of Ser. No. 456,976, Apr. 1, 1974, Pat. No. 4,019,216. This application Oct. 8, 1976, Ser. No. 730,750
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1973, 2315891
Int. Cl.[2] B60S *1/46*
U.S. Cl. 15—250.03 **11 Claims**



1. A windshield wiper which includes: spring bow means, a wiper blade in the form of a roll having wiping edge means and being connected to said spring bow means, a pad fastened to said roll and extending substantially along the length of said roll on at least that one side of said wiping edge means which faces the windshield to be contacted thereby, said pad being adapted to receive and store a cleaning fluid and substantially evenly to release the same onto the windshield to be wiped, rotary support means between the ends of said roll and the free ends of said spring bow means for holding said roll rotatable about its longitudinal axis in said spring bow means, and a wiper blade lip on said wiping edge means projecting from said roll towards the windshield to be wiped, the surface of said pad adjacent at least one side of said lip bearing on the windshield surface to be wiped during the wiping operation of said windshield wiper.

4,103,385
METHOD OF FORMING IMPROVED WINDSHIELD WIPER BLADES
Raymond P. Porter, North Dartmouth, Mass., assignor to Acushnet Company, New Bedford, Mass.
Continuation-in-part of Ser. No. 667,163, Mar. 15, 1976, Pat. No. 4,045,838. This application Nov. 15, 1976, Ser. No. 741,570
The portion of the term of this patent subsequent to Sep. 6, 1994, has been disclaimed.
Int. Cl.[2] B60S *1/38*
U.S. Cl. 15—250.36 **14 Claims**



1. A process of forming an improved flexible windshield wiper blade predominantly composed of polyisoprene, zinc oxide, carbon black and sulfur comprising the consecutive steps of:
(a) melt extruding at least one blade member;
(b) curing the blade member in a heated salt bath;
(c) rinsing the blade member;
(d) treating the blade member to harden its surface at least on the sides of the lip of the blade to a coefficient of friction no greater than about 2.1 according to Friction Test CFRP 113;
(e) drying the blade member;
(f) applying at least one coating to at least the sides of the lip of said blade member, said coating having a Young's modulus of from about 10^6 to about 10^{11} dynes/cm^2 and said coating extending all the way to the lip edge and said coating having a coefficient of friction greater than the coefficient of friction of said surface of said basic blade;
(g) drying the coated blade member;
(h) curing the coated blade member.

8. A process of forming an improved flexible windshield wiper blade comprising:
(a) melt extruding at least one blade member;
(b) setting the extrudate;
(c) treating the blade member to harden its surface at least on the sides of the lip of the blade to reduce its coefficient of friction to no greater than about 2.1 according to Friction Test CFRP 113;
(d) applying at least one coating to at least the sides of the lip of said blade member, said coating having a Young's modulus of from about 10^6 to about 10^{11} dynes/cm^2 and said coating extending all the way to the lip edge and said coating having a coefficient of friction greater than the coefficient of friction of said surface of said basic blade;
(e) curing the coated blade member.

13. A flexible windshield wiper blade comprising a basic blade portion which is formed by extrusion and which has a coefficient of friction on at least the sides of the lip of the blade of no greater than about 2.1 according to Friction Test CFRP 113, said basic blade being selected from the group consisting of those blades which inherently have a coefficient of friction of no greater than about 2.1 those blades which have a coefficient of friction above 2.1 and which have been treated to reduce their coefficient of friction so that it is no greater than 2.1, and those blades which have a coefficient of friction above 2.1 which have been coated to reduce their coefficient of friction

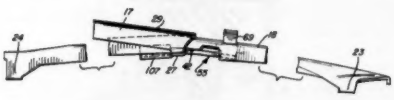
so that it is no greater than 2.1, at least on coating on said sides of the lip extending all the way to the lip edge, said at least one coating having a coefficient of friction greater than the coefficient of friction of said surface of said basic blade and said coating being selected from the group consisting of those elastomeric and plastic materials having a Young's modulus of from about 10^6 to about 10^{11} dynes/cm^2, said coating being of a thickness effective to reduce the number of streaks the coated blade will give in Wipe Test WT-1 as compared to the number of streaks given by said basic blade.

4,103,386

LOCKING CLIP

John J. Arndt, Chesterton, Ind., assignor to The Anderson Company, Gary, Ind.

Filed Mar. 14, 1977, Ser. No. 776,997
Int. Cl.[2] B60S *1/04*
U.S. Cl. 15—250.42 **11 Claims**



9. In a pressure-distributing superstructure for a wiper blade having at least two generally elongate parts connected together, a pair of aligned claws formed on at least one end portion of one of said parts, said claws passing through a reduced sized portion of said other part, a locking clip carried by said other part for maintaining said parts in assembled relationship comprising:

said clip having a mounting portion with a pair of laterally spaced legs extending from a crosspiece and interlocking with said other part to prevent relative movement between said clip and said other part; and

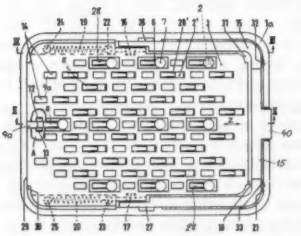
said clip having a latching portion with a pair of laterally spaced legs extending longitudinally from said mounting portion, means formed in each latching portion leg for receiving a respective claw therein, whereby said parts may be assembled or disassembled by closing said latching portion legs together and moving said claws into or out of said means.

4,103,387

BRUSH WITH RETRACTABLE BRISTLES

Leopold Anetseder, Jr., and Leopold Anetseder, Sr., both of Munich, Germany, assignors to Leopold Anetseder, Jr., Munich, Germany

Filed Aug. 10, 1976, Ser. No. 713,214
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1975, 2535773
Int. Cl.[2] A46B *9/10*
U.S. Cl. 15—203 **20 Claims**



1. A collapsible brush comprising:

a generally flat body with a first member defining a first major surface or said body and a second member defining a second major surface of said body, said second member being superposed on said first member with limited relative slidability in a predetermined direction along a parting plane generally parallel to said major surfaces between a first and a second stop position;

a set of bristle carriers journaled in one of said members and provided with coupling formations extending across said parting plane into engagement with coacting camming formations within the other of said members for swinging said carriers and their bristles about pivotal axes transverse to said predetermined direction upon a relative shift of said members between said stop positions, said bristles being retracted into said first member in said first stop position and projecting perpendicularly from said first major surface in said second stop position; and

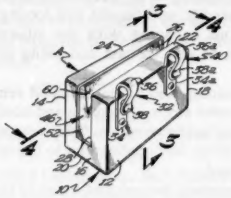
connecting elements on one of said members passing through slits on the other of said members and terminating in heads holding said members together.

4,103,388

OIL DIP STICK WIPER

James L. DeVitis, 5 E. Lyons St., Duluth, Minn. 55811

Filed Mar. 4, 1977, Ser. No. 774,327
Int. Cl.[2] F01M *11/12*; G01F *15/12*
U.S. Cl. 15—210 B **1 Claim**



1. An oil dip stick wiper compromising:

(a) a housing having spaced flat sidewalls,

(b) flat end walls of a length less than said sidewalls

(c) a flat bottom and

(d) a top,

(e) each of said end walls having a slot extending from the upper end and terminating short of the lower end of the wall,

(f) said top having a slot extending throughout the length thereof and coterminous with said slots in said end walls,

(g) an oil absorbent pad of a length less than the internal length of the housing,

(h) each of said end walls having an L-shaped projection with one leg thereof carried by the inner surface of the end wall for positioning the pad spaced from the end wall and with the other leg carried by the bottom for positioning the pad spaced from the bottom,

(i) said pad having a slot formed in the upper edge thereof coterminous with said slot in said top,

(j) hook-like clip means mounted on the flat outer surface of a sidewall of said housing for attaching the wiper to a portion of an internal combustion engine.

4,103,389

CLEANING UNIT

Marvin Resnick, and Stanley Homer Mounts, both of Washington, Pa., assignors to Textile Associates, Inc., Washington, Pa.

Filed Mar. 25, 1976, Ser. No. 670,115
Int. Cl.[2] A47L *5/38*
U.S. Cl. 15—302 **19 Claims**

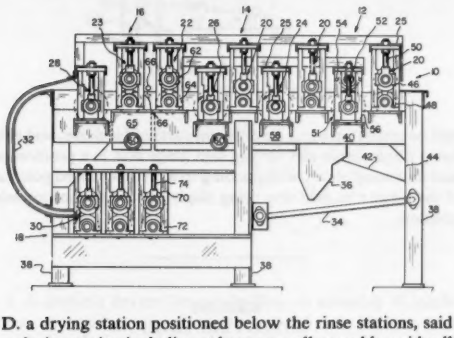
8. A cleaning machine for mats having a stiff backing and a fibrous nap comprising:

A. an entry station for receiving the mats stiff backing side up, said entry station including at least one feed roll assem-

bly and a beater roll positioned above a pass line of the mat for beating the stiff back;

B. a washing station adjacent the entry station for receiving the mats, said washing station including a soap tank having mounted therein at least one wet wash brush roll for engaging the nap,

C. a rinse station adjacent the wash station for receiving the washed mats, said rinse station including a rinse tank and a wringer roll assembly for passing the mats therethrough;



D. a drying station positioned below the rinse stations, said drying station including at least one roll assembly, said roll assembly comprising a floating upper heated roll for engaging the nap and a lower nonheated roll for engaging the backing; and

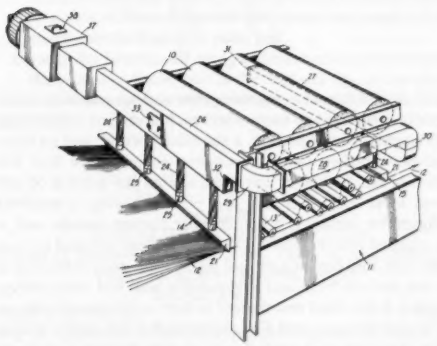
E. a duct means communicating between the rinse station and the drying station for inverting the mats so as to feed the mats nap side up into the drying station.

4,103,390

SLASHER VACUUM CLEANING SYSTEM

Samuel M. Tucker, Rome, Ga., assignor to John C. Robinson; Wade H. Youngblood and Harry H. Briscoe, all of Rome, Ga., part interest to each

Filed Dec. 20, 1976, Ser. No. 752,450
Int. Cl.[2] A47L *5/38*
U.S. Cl. 28—173 **10 Claims**



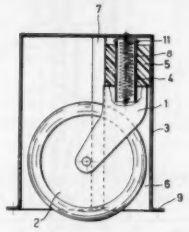
7. A vacuum cleaning system for the creel portion of a slasher comprising a suction source, suction manifolds mounted near opposite ends of the creel above a sheet of warps passing into the slasher, a pair of suction cleaning heads, each suction head being suspended by a plurality of tubes from its associated manifold and extending transversely across the sheet of warps in close proximity to the top of the sheet, said suction source being in fluid communication with said manifolds and through said pluralities of tubes, with said suction heads.

4,103,391

WHEEL UNIT FOR MOUNTING IN A SUITCASE

Hans Thomas Thomsen, Friisvej 10, DK-2635, Ishoj, Denmark

Filed Jun. 27, 1977, Ser. No. 810,594
Claims priority, application Denmark, Aug. 19, 1976, 3743/76
Int. Cl.[2] B60B *33/06*
U.S. Cl. 16—33 **10 Claims**



1. A wheel unit for use in a suitcase, comprising:

(a) a housing adapted to be secured to the suitcase, and having an outwardly directed opening,

said housing having a guide channel at one end, and there being locking recesses within said housing adjacent to one end of said channel at said opening;

(b) a bearing block movably supported on said housing, and slidable linearly in said guide channel, said bearing block having a cross-section corresponding to that of said guide channel;

(c) a wheel bracket having a connection with said bearing block for movement therewith, and said connection also enabling said bracket to be turned with respect to said housing, a portion of said bracket in response to 90° of such turning being receivable in said locking recesses in said housing;

(d) a wheel rotatably carried on said wheel bracket and being movable between a retracted position substantially inside said housing and an extended position outside said housing; and

(e) a spring reacting against said housing and biasing said bearing block, said wheel bracket and said wheel to urge said wheel toward said retracted position.

4,103,392

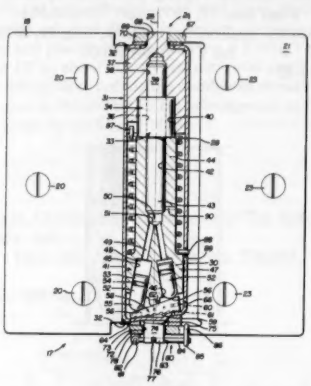
DOOR CLOSING APPARATUS

Robert D. MacDonald, Phoenix, Ariz., assignor to Masco Corporation, Taylor, Mich.

Filed Oct. 26, 1976, Ser. No. 735,305
Int. Cl.[2] E05F *3/20*
U.S. Cl. 16—54 **23 Claims**

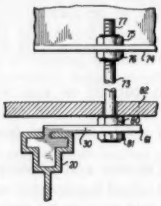
1. A door closing apparatus comprising a swash plate hydraulic damping apparatus for controlling the rate at which a door closes with respect to a fixed support to provide a relatively constant closing force, said damping apparatus having a swash plate with at least one sloping surface, piston means for engaging said swash plate, second rotatable means for effecting relative motion between said piston means and said swash plate such that the rotational resistance encountered as said piston means operatively engages said swash plate is proportional to the rate of rotation of said second rotatable means, spring means having a first portion anchored to one of said door and said fixed support and said spring means also having a second portion, and a first rotatable means operatively coupled between said second portion and the other of said door and said fixed support for rotating in a first direction when said door is opened to wind-up said spring means, said first rotatable means being responsive to the unwinding of said spring means when said door is released for rotating in a direction opposite to said first direction, and a one-way clutch means having an input element operatively coupled to said first rotatable means for

rotation therewith and an output means responsive to the rotation of said first rotatable means in said opposite direction



for controllably rotating said second rotatable means to close said door with a relatively constant closing force.

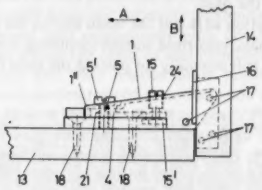
4,103,393
CURTAIN SUSPENSION ASSEMBLY
Richard W. Janson, Box 8110, Canton, Ohio 44711
Division of Ser. No. 617,508, Sep. 29, 1975, Pat. No. 4,014,071.
This application Oct. 22, 1976, Ser. No. 734,984
Int. Cl.[2] H47H *1/104*
U.S. Cl. 16—94 R **5 Claims**



1. A traverse rod for supporting curtains and the like in combination with a supporting structure, said rod comprising an upper support portion which defines a cruciform-shaped groove and a lower portion which defines a flange, said rod being symmetrically disposed on either side of a vertically disposed plane parallel to its length and having a substantially uniform cross-section within a further vertical plane perpendicular to the first-mentioned plane, said supporting structure comprising a cruciform-shaped part adapted to mate with and be slideably received in said groove and a connection part integral with and extending from said cruciform-shaped part, a suspended roof immediately above said rod, said supporting structure providing support for said suspended roof as well as for said rod.

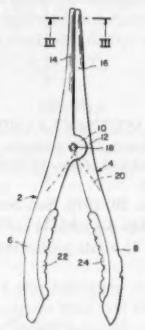
4,103,394
DOOR HINGE
Erich Röck, Höchst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Hochst
Filed Mar. 18, 1977, Ser. No. 779,230
Claims priority, application Austria, Apr. 8, 1976, 2569/76
Int. Cl.[2] E05D *7/04*
U.S. Cl. 16—129 **12 Claims**

1. A hinge arrangement particularly for pieces of furniture comprising a mounting plate which can be positioned on a piece of furniture, a hinge arm carrying link means anchorable on said mounting plate, at least one stop placed in the path of motion of said hinge arm, a counter-stop, said first mentioned resting against said counter-stop when said hinge arm is positioned on said mounting plate, said hinge arm having a U-shaped profile and a cross-member, said counter-stop being formed by said cross-member of said hinge arm, said stop and



said counter-stop being on different parts of furniture, said stop being displaceable and forcing said hinge arm in a position on said mounting plate corresponding to a predetermined position of the hinge arm, said stop being displaceable for adjusting said position.

4,103,395
SHELL FISH TOOL
William Latorella, 61 Gourley Rd., Medford, Mass. 02155
Filed Aug. 4, 1977, Ser. No. 821,691
Int. Cl.[2] A22C *29/00*
U.S. Cl. 17—71 **6 Claims**



1. A shell fish tool comprising first and second lever units pivotally connected to each other, each lever unit comprising an elongated handle portion, a shoulder portion, and an elongated jaw portion, said jaw portions comprising a first jaw portion of said first lever unit and a second jaw portion of said second lever unit, said first jaw portion having a sectional configuration including a first circular convex outside wall, a first rounded convex inside wall and a second rounded convex inside wall, said first and second inside walls each extending at one end thereof from said first outside wall and each joining the other at the other end thereof to form a sharp angle depression in said first jaw, said first and second inside walls forming a first jaw face, said second jaw portion having a sectional configuration including a second circular convex outside wall, a third rounded concave inside wall and a fourth rounded concave inside wall, said third and fourth inside walls each extending at one end thereof from said second outside wall and each joining the other at the other end thereof to form a sharp angle protrusion in said second jaw, said third and fourth inside walls forming a second jaw face, said first and second jaw faces being complementarily shaped and engageable with each other, said first and second outside walls defining in section a complete circle when said first and second faces are engaged.

4,103,396
DUAL ZONE WET DRAFTING DEVICE FOR TWISTLESS YARNS

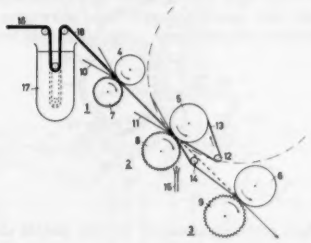
Jan Nijhuis, Hengelo, Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Mar. 14, 1975, Ser. No. 558,316

Claims priority, application Netherlands, Apr. 5, 1974, 7404653

Int. Cl.[2] D01H *5/22, 5/72*

U.S. Cl. 19—66 R **1 Claim**



1. A drafting device for wet drafting an assembly of staple fibres, comprising:

a. three cylinder pairs arranged one behind the other, so as to form first and second drafting zones;

b. first condenser means arranged at the feed-in side of the first cylinder pair, for removing most of the excess of liquid between staple fibres being drafted, and for bundling the staple fibres more compactly;

c. second condenser means arranged at the feed-in side of the second cylinder pair for bundling the staple fibres still more compactly at the end of the first drafting zone;

d. a belt passed around a first roller of the second cylinder pair and a wheel downstream of said second cylinder pair, said belt running at a given angle to a feed-through direction of the assembly of staple fibres being drafted so as to reduce fibre sticking, any fibres tending to stick being pulled along by accelerating fibres;

e. a guide positioned between the second and third cylinder pairs to one side of a direct path between lines of contact of the second and third cylinder pairs, so arranged that an assembly of fibres being drafted passes over a side of said guide remote from said path; and

f. means for blowing air along a surface of a second roller of the second cylinder pair at the feed-out side of the pair in a direction opposite to the surface velocity of the second roller.

4,103,397
LINT SLIDE GRID HUMIDIFIER

Samuel G. Jackson, P.O. Box 16587, Lubbock, Tex. 79490

Filed Jan. 3, 1977, Ser. No. 758,698

Int. Cl.[2] D01B *1/04*

U.S. Cl. 19—66 CC **6 Claims**

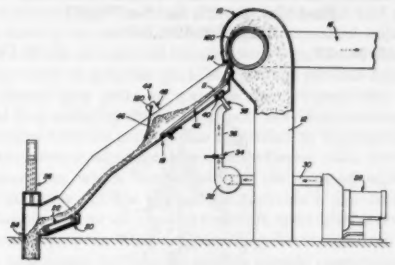
1. A Apparatus for humidifying lint cotton in a cotton gin, comprising, in combination:

(a) conveyor means for receiving material and controlling the movement of the material along a path of travel;

(b) exchanger means disposed on the conveyor means in the path of travel of the material for subjecting the material to a treating fluid; and

(c) the conveyor means including retarder means for holding the material on the exchanger means for a predetermined period of exposure to the treating fluid, the exchanger means including, in combination:

(1) grid means arranged on the conveyor means for forming a part of the path of travel of the material; and



(2) diffuser means arranged on the conveyor means beneath the grid means for passing the fluid through the grid means.

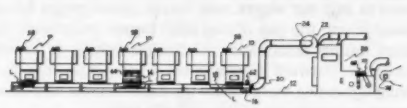
4,103,398
METHOD AND APPARATUS FOR BLENDING TEXTILE FIBERS

Ralph H. Rhyne, and Dan S. Wise, both of Bessemer City, N.C., assignors to Wise Industries, Inc., Bessemer City, N.C.

Filed Jul. 5, 1977, Ser. No. 812,514

Int. Cl.[2] D01G *13/00*

U.S. Cl. 19—145.5 **4 Claims**



1. Apparatus for blending textile fibers, comprising:

(a) a continuously moving and horizontally extending conveyor;

(b) a plurality of fiber depositing means positioned at spaced locations along the extend of said first conveyor surface, said plurality of fiber depositing means being selectively operable to deposit simultaneously a plurality of predetermined fiber loads on said continuously moving conveyor at spaced locations therealong;

(c) a receiver unit having a selectively movable and horizontally extending conveyor therein, and vertical side walls extending upwardly from a portion of said selectively movable conveyor to form a chute for guiding and stacking fiber on said selectively movable conveyor, said receiver unit including a compressing conveyor located in spaced angular relationship above said selectively movable conveyor for compressing and holding said stacked fibers therebetween;

(d) suction means located adjacent the delivery end of said continuously moving conveyor for accepting said plurality of fiber loads and for serially and separately delivering said fiber loads to the upper portion of said chute;

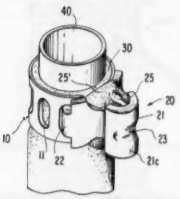
(e) a rotating beater roll associated with said receiver unit and located adjacent the delivery ends of said selectively movable conveyor and said compressing conveyor for engaging the edges of said fiber stacks delivered to said beater roll when said selectively movable conveyor and said compressing conveyor are operated; and

(f) control means selectively operable to start movement of said selectively movable conveyor and said compressing conveyor after a pre-set time period following said simultaneous dumping of said plurality of fiber loads, and to stop movement of said selectively movable conveyor and said compressing conveyor after said fiber loads stacked on said selectively movable conveyor by said chute have moved a predetermined distance.

4,103,399
HOSE CLAMP

Hans Oetiker, 21 Oberdorfstrasse, Horgen, Switzerland

Filed Mar. 2, 1977, Ser. No. 773,653
Int. Cl.[2] B65D *63/06*
U.S. Cl. 24—22 24 Claims

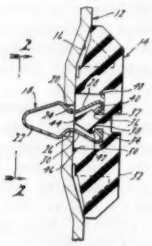


1. A hose clamp for tightening a hose onto a fixed member disposed within said hose, comprising clamping band means provided with a gap in at least one place thereof and means including approximately U-shaped deformable ear means interconnecting said clamping band means, said ear means having leg portions extending generally away from said clamping band means and being operable upon deformation of said ear means by contraction of said leg portions within the area of their connection with the band means to also draw together the clamping band means at said gap and to thereby tighten the hose onto the fixed member, characterized by elastic insert means in said ear means, said elastic insert means being displaceable into the gap of said band means underneath the ear means during deformation of the ear means to effectively counteract outward displacement of the hose into the gap during tightening thereof onto the fixed member and therewith prevent non-tightness within the gap area.

4,103,400
DART CLIP

Robert A. Munse, Troy, Mich., assignor to Microdot Inc., Greenwich, Conn.

Filed Jul. 25, 1977, Ser. No. 818,510
Int. Cl.[2] A44B *21/00*; B60R *13/02*
U.S. Cl. 24—73 MF 4 Claims

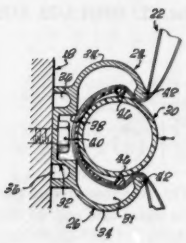


1. A dart clip for the retention of a first member having an arrow-shaped projection thereon to a second member having an aperture therein, said clip comprising a spring metal strip folded to a generally V-shaped configuration, the leg portions of said clip having end portions re-entrantly folded toward each other for gripping engagement with said first member, said end portions having end faces which bear in flat juxtaposed relation against complementary surfaces on said arrow-shaped projection.

4,103,401
SHEET GRIPPING ASSEMBLY

John L. Conley, 3870 Chino Ave., Chino, Calif. 91710

Filed Feb. 3, 1977, Ser. No. 765,098
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—243 K 8 Claims



1. A sheet gripping assembly for thin pliable sheet material such as plastic film, comprising:

an elongate channel-like base member containing a longitudinal, laterally opening channel bounded along its sides by side walls on the member having sheet gripping edges bounding the side opening of the channel,

an elongate sheet gripping channel member having an open longitudinal side bounded by longitudinal sheet gripping edges on the channel member and a major lateral dimension greater than the width of said base member side opening,

an elongate gripping bar member having a major lateral dimension greater than the width of said base member side opening and shaped to fit closely within said gripping channel member with the bar member protruding through the open side of said channel member to resist lateral deflection of said channel member edges toward one another, and

certain of said members being laterally resilient whereby said gripping members may be inserted channel member first into said base member channel through said base member side opening with sheet material extending through the channel between said channel walls and said gripping members and to sheet gripping positions behind said base member gripping edges wherein said gripping bar member fits within said gripping channel member, said sheet material is gripped between said base member gripping edges and said gripping bar member, and tension force in said sheet material tending to dislodge said gripping members from said base member channel through said base member side opening urges said gripping channel member outwardly to engage said gripping channel edges with said base member gripping edges, thereby further gripping the sheet material and preventing dislodging of said gripping members from said base member channel.

4,103,402
EDGE DRIVE STOP MECHANISM FOR FABRIC SPREADERS

Robert Frezza, Carle Place, N.Y., assignor to Samcoe Holding Corporation, Woodside, N.Y.

Filed May 4, 1977, Ser. No. 793,610
Int. Cl.[2] D06C *5/00*
U.S. Cl. 26—74 9 Claims

1. In an apparatus for processing tubular knitted fabric and including a spreader frame and opposed edge drive rolls engaging and supporting said spreader frame, an improved system for detecting displacement of said spreader frame with respect to said edge drive rolls, which comprises

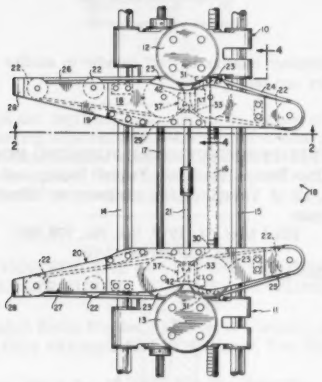
(a) magnetic sensing switches mounted closely adjacent to and in predetermined relation to said edge drive rolls,

(b) said sensing switches being mounted below the plane of said spreader frame,

(c) magnetic elements mounted in fixed relation to said spreader frame at each side thereof and normally positioned in close proximity to said magnetic sensing switches,

(d) said magnetic sensing switches being operative to stop said processing apparatus upon displacement of a magnetic element in relation to its associated sensing switch.

7. In an apparatus for processing tubular knitted fabric and including a spreader frame and opposed edge drive rolls engaging and supporting said spreader frame, and where the spreader frame includes spaced, longitudinally extending belt



frames each mounting a pair of belt drive rolls engaging an edge drive roll in straddling relation, an improved system for detecting displacement of said spreader frame with respect to said edge drive rolls, which comprises

(a) a permanent magnet member mounted on each of said belt frames generally between the belt drive rolls thereof,

(b) a sealed, magnetic sensing switch associated with each of said edge drive rolls and positioned for cooperation with said magnetic elements when said belt drive rolls are properly positioned with respect to said edge drive rolls, and

(c) means for adjustably positioning said switches in relation to said edge drive rolls immediately below a plane defined by said spreader frame.

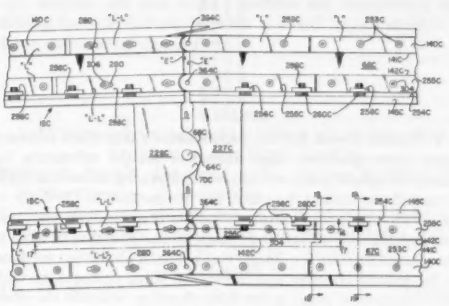
4,103,403

TENTER GUIDE RAIL GAP CROSSING MECHANISM

Henry Parrillo, Johnston; John Sherman Harrington, Warwick, and Glenn Howard Curtis, North Kingstown, all of R.I., assignors to Marshall and Williams Company, Providence, R.I.

Filed Nov. 18, 1974, Ser. No. 524,550
Int. Cl.[2] D06C *3/04*
U.S. Cl. 26—91 **1 Claim**

1. Apparatus for stretching web material by use of tentering clips and providing a uniform distribution of transverse stretching forces comprising a frame, a plurality of cross members secured to said frame, a plurality of bearings fastened to each cross member, a plurality of shafts, one for each cross member, each shaft having a right hand thread and a left hand thread, means rotatably mounting said shafts in said plurality of bearings, a plurality of saddles, two for each cross member, means slidably mounting said saddles to said cross members, a plurality of nuts, one secured in each saddle, one nut of one saddle of an associated shaft connected to a right hand thread, alternately, another nut of the other saddle of the shaft connected to a left hand thread, whereby rotation of the shaft in one direction draws the saddles toward each other and rotation of the shaft in an opposite direction separates said saddles, a plurality of blocks, one for each saddle, means slidably mounting a block in each saddle, a plurality of pivot pins, one fastened in each block, a plurality of grooved guide straight rail sections having straight tenter clip engaging faces pivotally mounted to said saddles, with the end of one rail being pivotally mounted to the end of an adjacent rail through said pivot pins, thereby to provide two pivotally connected adjacent grooved guide straight rail sections with a gap therebetween, said plurality of grooved guide straight rail sections forming two closed loop paths to accommodate, respectively, two closed loop tentering chains, said shafts providing incremental adjustment between pairs of rails controlled by the same shaft and incremental adjustment between adjacent rails, that improvement in which means between the ends of adjacent grooved guide straight rail sections provide a gap crossing mechanism, said means yielding on an arc upon relative pivotal movement between adjacent grooved guide straight rail sections, said means providing a smooth arcuate connection between the straight tenter clip engaging faces having various degrees of diverging and converging relationship with respect to one another, said plurality of pivotally connected adjacent grooved guide straight rail sections each having a body provided with a front projection, and a rear flange, a plurality of front projection wear strips having a tenter clip engaging face,



screw means fastening said wear strips to said front projection, the wear strips on opposite ends of each front projection having a lower shelf and an upper shelf, respectively, and each shelf having a rounded end, the lower shelf of one front projection wear strip slidingly engaging the upper shelf of an adjacent front projection wear strip, pivot pin means pivotally connecting an upper shelf to a lower shelf to provide an arcuate tenter clip engaging face across the gap between adjacent pivotally connected straight rail sections, said rear flange having a cut-back to provide a seat, and a longitudinal surface, a plurality of rear wear strips, each wear strip comprising a body having an upstanding arm and a lower tenter clip engaging face, means slidably mounting said plurality of rear wear strips to said rear flange for sliding movement, longitudinally and laterally, to said seat, said rear wear strips on opposite ends of said rear flange having a lower shelf and an upper shelf, respectively, and each shelf having a rounded end, the lower shelf of one rear strip slidingly engaging the upper shelf of an adjacent rear wear strip, pivot pin means pivotally connecting an upper shelf to a lower shelf to provide an arcuate tenter clip engaging face between adjacent pivotally connected grooved guide straight rail sections.

4,103,404

NOZZLE DEVICE FOR THE PRODUCTION OF TEXTURIZED FILAMENT YARNS

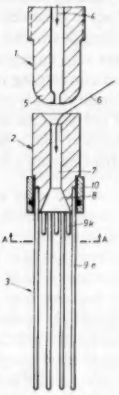
Wolfgang Bäcker, Dormagen; Heinzbert Wojahn, Monheim; Hans-Theo Esser, Cologne; Karlheinz Feltgen, Dormagen, and Roland Weisbeck, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 11, 1977, Ser. No. 814,651

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1976, 2631393

Int. Cl.[2] D02G *1/12, 1/16*

U.S. Cl. 28—255 **11 Claims**



1. Nozzle device for the production of texturised filament yarns from synthetic, high molecular weight substances by means of heated gases or vapours, comprising three chambers arranged one behind the other, the hot medium in the form of gas or vapour flowing into one section in its first chamber and the thread being sucked at an angle to the direction of flow in the second section, the thread being heated by the hot medium in the second chamber and the thread being compressed with the formation of plugs in the third chamber, wherein the compression chamber is formed from elastically soft flexible rods which are arranged on the surface of a right circular cylinder or a right circular truncated cone and fixed at one end on the end of the second chamber, said compression chamber being formed from rods of two different lengths *l* and *k*.

4,103,405

TOOL CHANGING ARRANGEMENT

Günther Blum, Gullen, Rauensburg, and Gerhard Stark, Notzingen, both of Fed. Rep. of Germany, assignors to Stama Stark Maschinenfabrik Gotthilf Stark, Schlierbach, Fed. Rep. of Germany

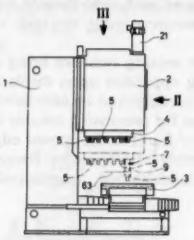
Filed Jun. 14, 1976, Ser. No. 695,654

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1975, 2526902

Int. Cl.[2] B23Q *3/155*

U.S. Cl. 29—26 A **21 Claims**

1. A tool changing arrangement for a machine tool, comprising a rotary drive spindle movable in axial direction between two end positions; a tool holding member coaxially carried by said spindle for rotation therewith and axially movable with respect thereto, said tool holding member having a tool carrier receiving part projecting beyond one end of said spindle, said tool carrier receiving part comprising a cross bar extending transversely to the axis of said tool holding member; a tool carrier movable transversely to said holding member and having at one end facing said one end of said spindle a slot in which said cross bar is inserted for transmitting a turning movement from said spindle to said tool carrier; and centralizing portions at facing ends of said spindle and said tool carrier interengaging with each other during axial movement of said



holding member relative to said spindle to axially align said tool carrier and said spindle.

4,103,406

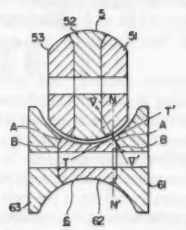
SPLIT TYPE SECTIONAL FORMING ROLL

Tsuneo Ito; Tatuya Hashiba; Takesi Inoue, and Kunihiro Nagata, all of Yasugi, Japan, assignors to Hitachi Metals, Ltd., Japan

Filed Mar. 16, 1977, Ser. No. 778,099

Int. Cl.[2] B21B *31/08*

U.S. Cl. 29—125 **16 Claims**



1. A split type sectional forming roller comprising a plurality of roll segments assembled together on a roll shaft to constitute a desired roll caliber profile, including at least one curved section, at least two adjacent segments of said plurality of roll segments mating along surfaces which are convex-concave frusto-conical and intersect at said curved section, wherein inner planar portions of said mating convex-concave frusto-conical surfaces extend perpendicularly with respect to the longitudinal axis of said roller shaft and wherein outer slanting portions of said convex-concave frusto-conical mating surfaces extend obliquely with respect to both the longitudinal axis of said roller shaft and a line which is both oblique with respect to said longitudinal axis and tangential with respect to the roll caliber profile at the peripheral point of said profile at which said frusto-conical surfaces mate, said slanting portions extending at an angle θ_A included in an angle θ_V formed between lines passing through said peripheral point which are normal to said tangential line and to said longitudinal axis, respectively.

4,103,407

MANUFACTURING METHOD FOR A HIGH PRESSURE DISTRIBUTOR ROTOR

Manuel Coll Elizalde, and Juan Simon Bacardit, both of Barcelona, Spain, assignors to The Bendix Corporation, Southfield, Mich.

Filed Jan. 7, 1977, Ser. No. 757,524

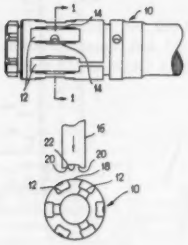
Int. Cl.[2] B21D *53/00, 53/10;* B23P *17/02*

U.S. Cl. 29—157.1 R **4 Claims**

1. A method for manufacturing a rotor for a high pressure distributor comprising the steps of:

providing a rotor having a plurality of axial grooves; and

applying a plurality of tools radially against the peripheral surface of said rotor to form chamfers on adjacent edges of consecutive grooves, one of said tools including protruding portions defining punches of predetermined



length and depth and said punches on the one of said tools contacting adjacent edges of consecutive axial grooves to form the chamfers when the one of said tools is applied radially against the peripheral surface of said rotor between the consecutive axial grooves.

4,103,408

METHOD FOR THE COLD WORKING OF HEAT EXCHANGER TUBING FOR THE ATTACHMENT OF SPIRAL FINS

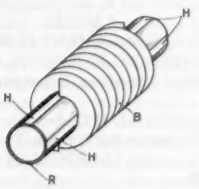
Alfred Joekel, Essen-Werden, Fed. Rep. of Germany, assignor to Balcke-Dürr Aktiengesellschaft, Ratingen, Fed. Rep. of Germany

Filed Jul. 27, 1976, Ser. No. 709,130

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1975, 2534217

Int. Cl.[2] B23P *15/26*

U.S. Cl. 29—157.3 AH **6 Claims**



1. In a method involving the production of finned heat transfer tubing, where one or more continuous metal strips are wound onto a length of smooth round tubing, as the latter is rotated, so as to create one or more helical fins on the tubing, the improvement comprising the step of:

shaping the cylindrical outer surface of the tubing prior to said winding operation, so as to form thereon at least one circumferentially narrow land which, in the subsequent winding operation, produces a corresponding very small inward deviation from the true circular inner curvature of the wound fins, thereby causing the non-circular portions of the wound fins to engage a longitudinal edge of the land, so as to prevent rotation of the fins relative to the tubing surface, independently of frictional engagement.

4,103,409

ANGULARLY ADJUSTABLE FORCE IMPARTING TOOL

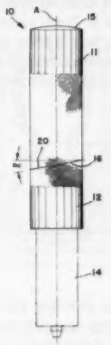
David W. Young, 421 Larkin, Akron, Ohio 44305

Filed Dec. 13, 1976, Ser. No. 749,750

Int. Cl.[2] B23P *19/04*

U.S. Cl. 29—249 **10 Claims**

1. A tool for imparting force to a mechanical element located in a confined area comprising, an impact member for receiving and transferring force applied thereto, an end member having a tapered recess in an outer end thereof engageable with the mechanical element, said end member and said impact member having mating faces at least one of which lies in a plane oblique to the force transmitting axis thereof for applying a force to the mechanical element from an angular position of



said impact member relative to said end member by selective relative rotation of said impact member and said end member, and a coil spring connector engaging and rotatably joining said end member and said impact member and maintaining said mating faces of said end member and said impact member in force transmitting engagement.

4,103,410

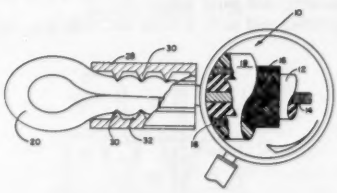
METHOD OF USING A FLEXIBLE MANDREL FOR MAKING A LOCKING CABLE

Phillip E. Pennell, Lakewood, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 598,959, Jul. 24, 1975, which is a division of Ser. No. 371,313, Jun. 18, 1973, Pat. No. 3,991,445. This application Jul. 18, 1977, Ser. No. 816,407

Int. Cl.[2] B23Q *17/00*

U.S. Cl. 29—403 **2 Claims**



1. A new use for a flexible mandrel used conventionally in the manufacture of tubular articles, the mandrel comprising an elongated heat setting polymeric rod in which is embedded a longitudinally disposed element of high modulus, the new use comprising reclaiming the mandrel for use in the production of a flexible locking cable by the sequential steps of:

cutting the mandrel to a desired length;

applying a metal reinforcement intimately onto the surface of the flexible mandrel thereby forming a metal reinforced flexible mandrel;

extruding a heat setting polymeric cover onto the reinforced mandrel forming a bond between the cover and reinforcement and sandwiching the reinforcement between layers of polymeric material, thus defining a length of cable;

attaching coupling means to each end of the cable so as to produce an end configuration engagable with locking means for coupling the ends of the cable together.

4,103,411

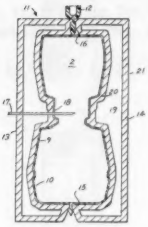
BLOW MOLDING METHOD

Marten Gottsegen, 1212 Lake Shore Dr., Chicago, Ill. 60610

Continuation of Ser. No. 537,288, Dec. 30, 1974, abandoned. This application Aug. 23, 1976, Ser. No. 716,927

Int. Cl.[2] B23P *17/00;* B29H *7/04*

U.S. Cl. 29—416 **13 Claims**



1. In a method of blow molding thermoplastic articles having interrelated sized parts comprising the steps of melting a plastic, extruding a tube of the plastic melt into a mold, closing the mold on the extrudate, expanding the plastic extrudate in the mold by applying fluid pressure internally thereof to form an object, cooling the mold, and removing the blown object, the improvement which includes the steps of:

(a) providing a tandem mold having a plurality of interconnected cavities;

(b) said interconnected cavities being interrelated and of different sizes or/and shapes;

(c) said interconnected cavities including:

(i) a first cavity adapted to form a first part of an object which is adapted to fit inside a second part of said object, and

(ii) a second cavity adapted to form said second object part;

(iii) said first cavity being adapted to provide an annular space between said first and said second parts;

(d) simultaneously expanding said plastic in both of said cavities to form interrelated parts of said object which form at least a part of a multi-part object;

(e) separating said parts; and

(f) interfitting said parts to form said object.

4,103,412

METHOD OF MAKING A FOAM FILLED DIE CAST BAT

George H. Krieger, St. Louis, Mo., assignor to St. Louis Diecasting Corporation, Bredgeton, Mo.

Division of Ser. No. 685,168, May 11, 1976, Pat. No. 4,056,267, which is a continuation-in-part of Ser. No. 468,815, May 10, 1974, abandoned, and a continuation-in-part of Ser. No. 549,701, Feb. 13, 1975, abandoned. This application May 25, 1977, Ser. No. 800,556

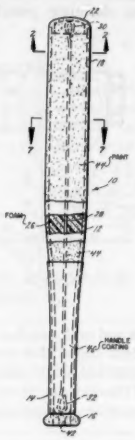
Int. Cl.[2] B23P *3/00, 19/04*

U.S. Cl. 29—460 **11 Claims**

2. A method for making a foam filled metal bat comprising the steps of:

(a) die casting a generally elongated porous metal tube element,

(b) die casting a second porous metal cap element having a portion adapted to fit within the metal tube element to form a closed end portion,



(c) welding the cap to the metal tube element to form a substantially non-porous weld seam, and

(d) filling the capped bat structure with a foam material.

4,103,413

METHOD AND ARRANGEMENT FOR FASTENING AND CENTERING PUNCHING TOOLS

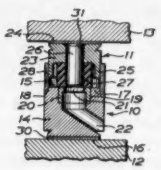
Sven Kurt Bernhard Malmberg, Bokvagen 3, S-265 00 Åstorp, Sweden

Filed May 11, 1977, Ser. No. 795,913

Claims priority, application Sweden, May 11, 1976, 7605336

Int. Cl.[2] B26F *1/02*

U.S. Cl. 29—465 **7 Claims**

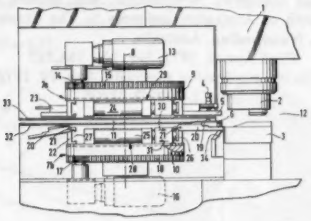


6. A punching tool setup method for fastening and centering a tool in presses having press members movable in relation to each other, said tool including die and punch elements, said punch element having a punch and a stripper, comprising the steps of positioning one tool element on one press member in a predetermined place, placing a setup socket on either tool element, centering said tool elements in relation to each other by means of said setup socket, fastening said tool elements in said centered position in relation to each other, mounting said setup socket for axial movement on said tool elements and to surround said punch and said stripper, said setup socket remaining in position on said tool elements during operation of said punch element.

4,103,414
MACHINE TOOL WITH AT LEAST ONE TOOL MAGAZINE

Eugen Herb, Ditzingen, and Erich Brekle, Benningen, both of Germany, assignors to Trumpf Maschinen AG, Switzerland Switzerland

Filed Jun. 10, 1976, Ser. No. 694,604
Claims priority, application Germany, Jun. 14, 1975, 2526764
Int. Cl.[2] B23D *27/00*; B23Q *3/155*
U.S. Cl. 29—568 **7 Claims**



1. In a machine tool, particularly a stamping or nibbling machine, having work support means defining a displacement plane in which a workpiece is movable, at least one tool carrier an axially movable male die located in said tool carrier, at least one tool magazine lying in a plane which is spaced from the displacement plane of the workpiece and which is rotatable about an axis substantially parallel to the longitudinal axis of movement of said male die in said tool carrier, tool holders in each magazine and a tool exchanger operable to move a tool from each magazine into said tool carrier and vice versa, the improvement comprising, in combination, means, mounting all tool holders in each magazine, except the tool holder carrying the tool to be exchanged, in a mounting plane spaced sufficiently from the displacement plane of the workpiece to provide clearance for displacement of the workpiece in its displacement plane, during working thereof by a tool then in a working position in a tool carrier, without interference with tools in a non-working position in a magazine; a lifting device operable, responsive to rotation of each magazine into a position to engage and align a tool holder with a tool to be exchanged, to move the thus aligned tool holder, relative to its magazine, out of the mounting plane, with the workpiece remaining in its displacement plane, and into a working plane which includes the working position of a tool in a tool carrier; said tool changing device having means engageable with each lifted tool holder responsive to such rotation of the associated magazine, and said tool changing device further including means operable to shift the thus lifted tool holder linearly relative to the associated tool carrier; each lifted tool holder, responsive to further rotation of a magazine, being disengaged from said tool changing device, and said lifting device lowering the tool holder, with a tool extracted from a tool carrier and from the working position, relative to its associated magazine into the mounting plane of the other tools in its associated magazine.

4,103,415
INSULATED-GATE FIELD-EFFECT TRANSISTOR WITH SELF-ALIGNED CONTACT HOLE TO SOURCE OR DRAIN

James A. Hayes, Mountain View, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Dec. 9, 1976, Ser. No. 748,977
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—571 **6 Claims**

1. Method comprising:

forming a substrate of semiconductor material of one conductivity type, the substrate having a principal surface;

growing a first layer comprising oxide passivation material over a portion of the principal surface;

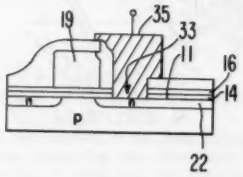
depositing a second layer comprising nitride dielectric material over a portion of the first layer;

forming a third layer comprising polysilicon material in a desired pattern over a portion of the second layer;

forming a plurality of spaced regions of opposite conductivity type, each region forming a PN junction with the substrate, with an edge of each junction extending to the principal surface under the first layer of oxide;

forming a fourth layer comprising phosphorous vapox over the third layer and exposed portions of the second layer;

removing a selected portion of the fourth layer to create a hole therethrough that extends to the second layer and abuts said third layer;



growing a fifth layer comprising oxide passivation material over exposed portion of the third layer;

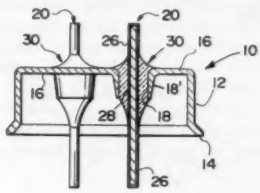
removing selected portions of the first and second layers to extend the hole therethrough to the principal surface overlying a region of opposite conductivity type, and

depositing conductive metal into the hole and onto the principal surface to provide electrical contact to the underlying region of opposite conductivity whereby said fifth layer provides electrical insulation between said conductive metal and said third layer.

4,103,416
METHOD OF MANUFACTURING AN HERMATICALLY SEALED ELECTRICAL TERMINAL

Yoshimasa Sakamoto, Otsu, Japan, assignor to New Nippon Electric Co., Ltd., Osaka, Japan

Filed Oct. 15, 1976, Ser. No. 733,013
Claims priority, application Japan, Oct. 21, 1975, 50/127247
Int. Cl.[2] H01B *17/26*
U.S. Cl. 29—630 D **5 Claims**



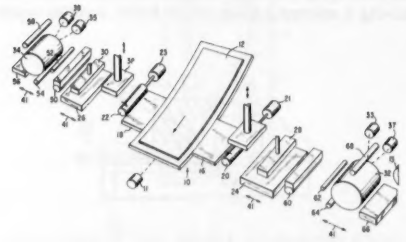
1. A method of making an electrical terminal device, comprising covering the free ends of an iron-chromium alloy lead wire with a layer of oxidation resistant metal, coating an intermediate length of said lead wire between said free ends with a resist material to prevent the covering of said length by said oxidation resistant metal, when the latter is applied to cover said free ends, removing said resist material, then oxidizing said intermediate length of said lead wire between said free ends to provide a chromium oxide layer intermediate said free ends, thereafter securing, in an insulated and sealed manner, said lead wire to a support cup means at said intermediate length having said chromium oxide layer thereon, said oxidizing taking place in a selective oxidation process to produce said chromium oxide layer.

4,103,417

WIRE STRINGING DEVICE

Richard Ernest Hoffman, and Maximiliaan Bruckner, both of San Jose, Calif., assignors to Dataproducts (Santa Clara), Inc., Santa Clara, Calif.

Filed Aug. 25, 1977, Ser. No. 827,466
Int. Cl.[2] H01F *41/08*
U.S. Cl. 29—737 **10 Claims**



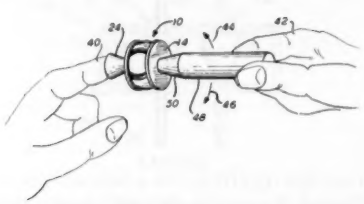
1. A device for stringing a multiplicity of wires through an array in a plurality of directions comprising:
- means for holding said wires in a preselected configuration;
- means for driving said wires through said array in a first direction;
- means for capturing said wires leaving said array in said first direction;
- means for providing tension on said wires leaving said array in said first direction and for redirecting said wires to pass through said array in a second direction;
- means for driving said wires in said second direction;
- means for capturing said wires leaving said array in said second direction; and
- means for providing tension on said wires leaving said array in said second direction and redirecting said wires to pass through said array in said first direction.

4,103,418

MANUALLY-OPERATED REVOLVABLE SHAVING DEVICE

Marcial Alvarez, 225 E. Jersey St., Elizabeth, N.J. 07206

Continuation-in-part of Ser. No. 732,744, Nov. 9, 1976, abandoned. This application Jul. 26, 1977, Ser. No. 819,108
Int. Cl.[2] B26B *21/00*
U.S. Cl. 30—50 **13 Claims**



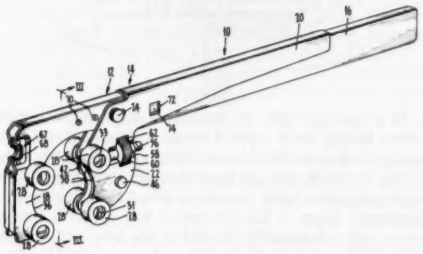
1. A manually-operated device for shaving areas of the skin in the course of surgical or cosmetic treatment or the like, said device comprising:
- a wheel-shaped shaving head, the rim of said wheel carrying a plurality of at least partially protruding shaving blades;
- generally cylindrical handle means rigidly secured to said wheel, and extending outwardly therefrom in alignment with the wheel axis, said means being of reduced diameter with respect to the diameter of said shaving head and being adapted for grasping by an operator to enable manual rotation of said wheel about said axis by rotation of said handle means; and
- a support member secured to said wheel and extending in alignment with the wheel axis from the side of said wheel opposite said handle means, said member being foreshortened in comparison to said handle means and adapted to be pivotably and rotatably supported by the hand of said operator opposed to that manipulating said handle means, thereby enabling rotation and orientation of said shaving body with respect to the skin area being shaved.

4,103,419

PIPE CUTTER

Bruce Ernest Matthews, Warrandyte, and Ronald Day, Mt. Evelyn, both of Australia, assignors to The Stanley Works Pty. Ltd., Nunawading, Australia

Filed Apr. 4, 1977, Ser. No. 784,337
Claims priority, application Australia, Aug. 19, 1976, PC7070
Int. Cl.[2] B23D *21/06*
U.S. Cl. 30—95 **9 Claims**



1. A pipe cutting device comprising:

A. a first operating member having an elongated handle portion and a jaw portion at one end thereof having its longitudinal axis extending transversely of the longitudinal axis of said handle portion;

B. a second operating member having an elongated handle portion and a jaw portion at one end thereof having its longitudinal axis extending transversely of the longitudinal axis of said handle portion, the longitudinal axes of the handle portions of said first and second operating members being closely spaced and substantially parallel, the jaw portion of said second operating member being disposed in spaced relationship to said first operating member to provide a spacing between said jaw portions for receiving a pipe therebetween;

C. pivot means pivotably mounting said operating members adjacent the jaw portion of said first operating member for movement of the jaw portions about a pivot point defined thereby in response to movement of said handle portions, said handle portions extending in close parallel relationship in the closed position thereof and the jaw portions also extending in generally parallel relationship in the closed position thereof, movement of said first operating member handle portion away from said second operating member handle portion causing pivoting of said jaw portions to increase the spacing therebetween at the outer ends thereof to permit insertion of a pipe therebetween;

D. a pair of guide roller means rotatably mounted on each of said jaw portions and spaced along the length thereof with the periphery of said guide roller means extending beyond the opposed edges of said jaw portions and defining an imaginary circle therebetween for gripping and rotatably supporting a pipe therebetween;

E. a cutting blade mounted on the jaw portion of said one operating member for movement beyond the opposed edges of the jaw portion and into the imaginary circle defined by said guide roller means; and

F. adjustment means for said cutting blade mounted on said jaw portion of said first operating member and operable to move said cutting blade relative to the opposed edge of the jaw portion, whereby the pipe may be gripped be-

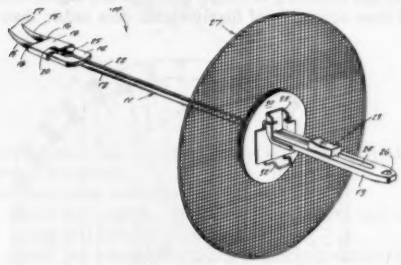
tween said jaw portions and supported upon said roller means by one-handed gripping of said handle portions and the cutting blade may be advanced by manipulation of the adjustment means into progressively deeper engagement with the associated pipe to sever the pipe upon rotation of the cutting device about the pipe.

4,103,420

UTENSIL WITH GREASE SHIELD

Albert F. Davis, 2148 W. Washburne, Chicago, Ill. 60608

Continuation-in-part of Ser. No. 627,235, Oct. 30, 1975, abandoned. This application Sep. 27, 1976, Ser. No. 727,253
Int. Cl.² A47J *43/28*
U.S. Cl. 30—129 **15 Claims**



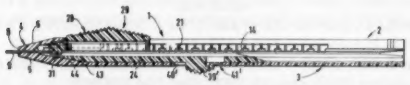
1. A protective hot item utensil comprising:
(a) elongated manipulating means including, at a first end, handle means for permitting the manual holding of said manipulating means, and, at a second end, retaining means for making contact with a hot item;
(b) shield means for preventing heated particles, traveling in a substantially straight line from the region in proximity to said retaining means, from reaching the region in proximity to said handle means; and
(c) coupling means including two parts, the first of said parts being coupled to said manipulating means and the second of said two parts being coupled to said shield means, said first and second parts being engageable with and disengageable from each other, for, when said first and second parts are engaged with each other, retaining said shield means at a predetermined location on and with a fixed orientation relative to said manipulating means.

4,103,421

BLADE-HOLDING CUTTING DEVICE

Michel Quenot, Besancon, France, assignor to Stanley-Mabo S.A., Besancon, France

Filed Apr. 29, 1977, Ser. No. 792,194
Claims priority, application France, Apr. 30, 1976, 76 13654
Int. Cl.² B26B *3/06*
U.S. Cl. 30—162 **5 Claims**



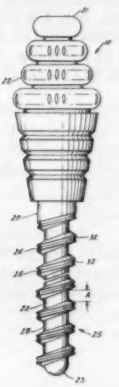
1. In a cutting blade holding handle having a segmented removable blade comprising a unitary generally rectangular hollow body formed of a molded plastics material and having a longitudinal slot extending through one side wall from one end thereof, a pair of facing longitudinal grooves within said hollow body terminating in an end slot through the other end of said body to slidably mount the blade to advance and retract the blade through said end slot, a series of notches formed along one edge of said longitudinal slot, and a unitary slider adapted to control the longitudinal movement of the blade, the improvement comprising a wedging member engageable with one side of the blade, said hollow body having an inclined interior wall adjacent said end slot, and said wedging member having a bevelled end engageable therewith to frictionally engage and apply a lateral pressure against the blade and means to slide said wedging member from an inactive position in which the wedging member does not apply lateral pressure to the blade to an active position wherein the wedging member is slid up the inclined interior wall adjacent said end slot and the bevelled end of said wedging member frictionally engages and applies a lateral pressure against the blade to lock the blade in position.

4,103,422

THREADED SELF-TAPPING ENDODONTIC STABILIZER

Charles M. Weiss, and Kenneth W. M. Judy, both of New York, N.Y., assignors to Oratronics, Inc., New York, N.Y.

Filed Mar. 7, 1975, Ser. No. 556,456
Int. Cl.² A61C *13/00*
U.S. Cl. 32—10 A **6 Claims**



1. In a threaded, self-tapping endodontic stabilizer for insertion into the jawbone of a patient's mouth through an aperture in a loose tooth to stabilize the tooth comprising an elongated penetrating member having adjacent its coronal end a head adapted for manual rotation and adjacent its apical end a threaded shaft defining a plurality of lands and grooves, the improvement wherein a plurality of said grooves have a longitudinal height of at least 0.20 mm. and a plurality of said lands have a shallow recess extending along the peripheral edge thereof.

4,103,423

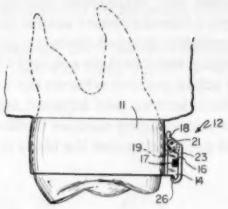
ORTHODONTIC BRACKET

Stanley P. Kessel, Suite 411, 3325 Hollywood Blvd., Hollywood, Fla. 33021

Filed Mar. 4, 1977, Ser. No. 774,447
Int. Cl.² A61C *7/00*
U.S. Cl. 32—14 A **11 Claims**

1. An orthodontic appliance comprising:
a bracket projecting from a tooth band and including two spaced ends;
a handle privotally attached to one of said spaced ends of said bracket;

a locking hook pivotally attached to said handle in an over-center relationship;



whereby as the handle is rotated to a locking position, the locking hook engages the other spaced end of the bracket and is locked thereto.

4,103,424

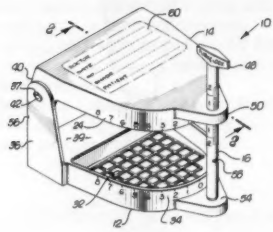
DENTAL ARTICULATION APPARATUS AND METHOD

Adrian Benjamin; Walter G. Churgin, both of Millburn; Frederick Biermann, Maplewood; David W. Benjamin, Millington, all of N.J.; Finton P. Cordell, Lutherville, Md.; Robert M. Tempkin, Rochester; Carl A. Zambrano, New York, both of N.Y., and Peter Halasz, West Los Angeles, Calif., assignors to Bergen Brunswig Corporation, Los Angeles, Calif.

Filed Jul. 12, 1976, Ser. No. 704,124

Int. Cl.[2] A61C *13/22*

U.S. Cl. 32—32 **3 Claims**



1. A device for dental articulation comprising in combination:

an upper cup member having first peripheral wall means for receiving a plaster mounted cast therebetween;

a lower cup member having second peripheral wall means for receiving another plaster mounted cast therebetween;

pivotal means connected to each of said cup members for allowing manually induced relative movement between said cup members, said pivotal means comprising a pair of horizontal dowels on one of said cup members respectively engagable with and rotatable in a pair of bearings on the outer of said cup members and wherein said bearings are slotted to enable relative lateral movement between said cup members.

4,103,425

MARINE NAVIGATIONAL PROTRACTOR

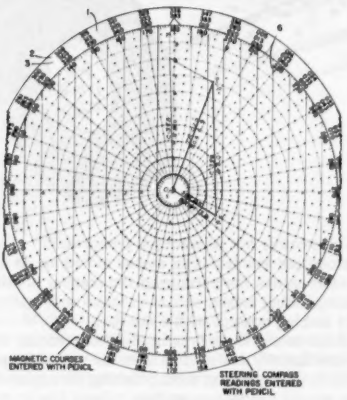
B. Wayne Harter, 823 Canyon Rd., Redwood City, Calif. 94062

Continuation-in-part of Ser. No. 501,821, Aug. 28, 1974. This application Dec. 8, 1975, Ser. No. 638,825

Int. Cl.[2] G01C *21/00*

U.S. Cl. 33—1 SD **1 Claim**

1. A 360° marine navigational protractor comprised of a transparent plastic disc, or chart overlay; with sufficient diameter to cover a geographic area on a conventional coastwise or harbor chart which includes most landmarks and navigational aids from which useful bearings can be taken; with graduations marked by means of short lines on the periphery at one degree intervals, the numerical values of said graduations being permanently printed thereon at ten degree intervals, along with reciprocals (values of graduations 180° away, or on the opposite side) permanently printed in smaller figures, and with slightly longer and more vivid graduations identifying each intervening five-degree mark; with equally-spaced circles printed from the center to the periphery, separated by a distance equal to one-half nautical mile on a chart with a scale of 1:80,000, and comprised of small but highly-visible dots rather than solid lines, said dots printed at one degree intervals, with still more visible dots or other appropriate marks being used at each five degree interval, said circles to be numbered consecutively in four places 90° apart, with number "1" being nearest the center; with straight lines radiating from the center and printed on the face of the instrument, starting at the inner most circle and extending to the periphery, at ten degree intervals, said lines consisting of highly-visible dots rather than solid



lines, each such dot representing one-tenth of the distance between circles, and with each fifth dot being more visible than the others; with a red-colored triangular pointer, or arrowhead, identifying the zero degree ("north" designation) printed on the periphery; with solid lines printed parallel to the 0° - 180° axis and tangent to the circles; with a border approximately ⅜ inch wide outside the periphery heretofore described, with the surface thereof treated so as to be translucent and permit the entry of erasable data with a common graphite pencil; with a small hole (no more than ¼ inch diameter) in the exact center of the instrument; and with an accompanying but separate cylindrical straight-edge of the approximate dimensions of a common "lead" pencil, carrying graduations permanently marked thereon equal to the spacing of the circles heretofore described, having ends which have been dipped in liquid latex or otherwise equipped with non-skid rubber tires.

4,103,426

APPARATUS FOR CONVERTING A MEASURING TAPE TO A COMPASS

Rollin Robin, 17815 Valley Vista Blvd., Encino, Calif. 91316

Filed Aug. 19, 1977, Ser. No. 825,930

Int. Cl.[2] B43L *9/04*

U.S. Cl. 33—27 C **8 Claims**

1. A compass comprising

a measuring tape including

a housing,

an elongated tape extensible from said housing, and

a holding means on the end of said tape extending out of said housing;

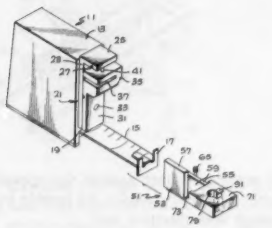
means for pivotally supporting said housing in a fixed position including

base means mounted on said housing,

pivot means pivotally mounted on said base means and having

means for selectively receiving and holding said elongated tape within said pivot means; and

center point means fixedly mounted on said pivot means and extensible beyond one edge of said housing when said pivot means is moved to a fixed position relative to said base means; and



means for mounting a marking device adjacent said holding means comprising

carriage means including

means for mounting said carriage means on said tape near said holding means and

means for releasably holding a marking device at a predetermined distance from said holding means.

4,103,427

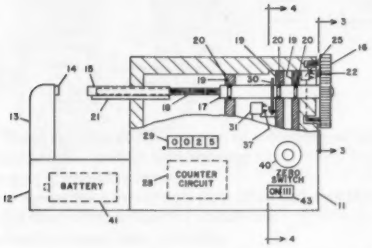
ELECTRONIC DIGITAL MICROMETER

Robert E. Ledley, III, Wilmington, Del., assignor to Suntech, Inc., St. Davids, Pa.

Filed Aug. 30, 1976, Ser. No. 718,749

Int. Cl.[2] G01C *03/18, 07/02*

U.S. Cl. 33—166 **5 Claims**



1. A micrometer having electronic means for determining the measurement of an object taken by the micrometer, said micrometer comprising:

(a) a micrometer housing, said housing having a side extension with an upward extending arm, forming a "U" shaped enclosure between the side of said housing and the upward extending arm;

(b) an anvil mounted on the inside edge of the upright extending arm;

(c) a spindle, slidably mounted by means to prevent its rotation through the micrometer housing so that it may be moved into contact with and away from said anvil, with the object to be measured being placed between the anvil and the spindle;

(d) a thimble, rotatably mounted on said housing;

(e) means for connecting the thimble to the spindle so that rotation of the thimble causes the spindle to move toward or away from the anvil;

(f) means for producing a first signal related to the amount of movement of the spindle toward or away from the anvil, wherein said first signal producing means includes,

(i) a light source,

(ii) light sensitive means for producing the first signal when light is sensed, and

(iii) means for reflecting pulses of light from the light source to the light sensitive means, the number of reflected pulses being related to the distance the spindle is moved;

(g) means for producing a second signal indicating the direction the spindle is moving, said second signal having a first value for movement of the spindle away from the anvil and a second value for movement of the spindle toward the anvil;

(h) a counter means, responsive to the second signal producing means for adding the first signals when the second signal has its first value, and for subtracting the first signals when the second signals has its second valve;

(i) means for displaying the number of signals counted by said counting means wherein the second signal producing means (g) comprises:

(i) means, responsive to the rotation of the thimble for producing a light absorbing surface at a predetermined point when the thimble is rotated in one direction, and for providing a light reflective surface at said predetermined point when the thimble is rotated in the opposite direction;

(ii) light source means for supplying light at this predetermined point; and,

(iii) means for sensing a presence of light at the predetermined point and for producing a signal related to the amount of light at the predetermined point, for receipt by the counter means.

4,103,428

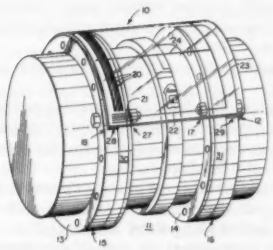
PIPE JOINT ALIGNMENT MEASURING TOOL

Lawrence L. Guzick, 10322 Royal Rd., Silver Spring, Md. 20903

Filed Nov. 1, 1977, Ser. No. 847,649

Int. Cl.[2] G01B *5/24*

U.S. Cl. 33—180 R **5 Claims**



1. A measuring instrument for determining the alignment between two pipes, said pipes coupled to each other through a joint and split flange arrangement, comprising:

an arcuate member having a radius of curvature approximately equal to the radius of curvature of the outer surface of said flanges;

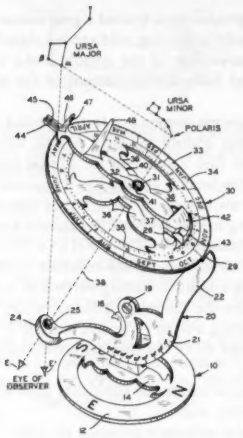
said member having a shoulder at one longitudinal end extending below the interior surface of said member and having lines marked on its surface;

whereby when said arcuate member is placed across said joint flush with against said flange surfaces with its shoulder abutting the side of one of said flanges, lateral displacement, twist, parallelism, and face to face dimensions of said joint may be compared to reference distances represented by said lines.

4,103,429
SUN AND STAR TIME DIAL

James E. Wagoner, Swanton, Ohio, assignor to Toledo Astronomical Association, Toledo, Ohio

Continuation-in-part of Ser. No. 770,521, Feb. 22, 1977. This application Aug. 22, 1977, Ser. No. 826,729
Int. Cl.[2] G01C *17/34, 21/02;* G04B *49/00*
U.S. Cl. 33—270 12 Claims



1. A sun and star time dial comprising:

A) a base supporting an east-west clampable pivot,

B) a first means angularly adjustable in a vertical plane and having aligned apertures at its ends, the axis of which first means is clampable at said pivot so that said apertures align with Polaris,

C) a freely rotatable date and hour disc radially mounted on and around said axis at one of said apertures, said disc having an outer peripheral date scale settable to an indicator on said first means and an inner peripheral time scale, and

D) a rotatable gnomon pointer means pivotly mounted on and around said one aperture and diametrically of said disc, said pointer means having:

1. a time indicating end cooperating with said inner time scale,
2. a sight at its other end projecting radially outwardly beyond the periphery of said disc for alignment with the other aperture of said first means for sighting a pointer star of the Big Dipper,
3. a gnomon orthogonal of and adjacent to said other end having an aperture whose axis is parallel to the longitudinal axis of said pointer means, and
4. a post intermediate the ends of said pointer means and parallel to said gnomon for alignment with the sun's rays through said aperture in said gnomon in the same plane as the longitudinal axis of said pointer means.

4,103,430
VIEWING DEVICE FOR A BUBBLE LEVEL

Joseph F. Schrader, 22 Pearl St., New Hartford, N.Y. 13413

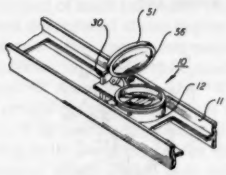
Filed Aug. 31, 1977, Ser. No. 829,443
Int. Cl.[2] G01C *9/32*
U.S. Cl. 33—348 8 Claims

1. Apparatus for use in conjunction with a bubble level of the type having at least one bubble indicator mounted between two opposed windows of a bubble housing, the apparatus including

a base member, containing a luminescent panel therein, being arranged to seat in contact against one of the windows of the bubble housing whereby the panel illuminates the bubble region,

a post affixed normal to the base and extending upwardly beyond the opposite window of the bubble housing,

a light shield having a central aperture therein slidably mounted upon the post and being arranged to be moved



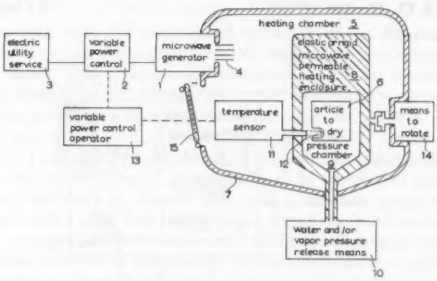
into seating contact against the opposite window of the bubble window whereby the bubble indicator is readable through said aperture, and

a viewing mirror adjustably pivotally mounted upon said light shield so that the illuminated bubble region within said aperture is viewable through said mirror.

4,103,431
MICROWAVE DRYING

Melvin L. Levinson, 1 Meinzer St., Avenel, N.J. 07001

Continuation-in-part of Ser. No. 572,385, Apr. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 325,330, Jan. 22, 1973, Pat. No. 3,881,027, Ser. No. 400,416, Sep. 24, 1973, Pat. No. 3,985,991, and Ser. No. 529,052, Dec. 3, 1974, Pat. No. 3,985,990. This application Aug. 10, 1976, Ser. No. 713,235
Int. Cl.[2] F26B *3/28*
U.S. Cl. 34—4 23 Claims



21. A process for drying a wet article which comprises:

stressing apart an elastic, liquid absortive material by inserting said wet article in an opening within said material, and

exposing said article, confined by said elastic material, to microwave energy until said article is dried.

4,103,432
VEGETABLE DRYING APPARATUS

Frank L. Dieterich, 3727 S. Robertson Blvd., Culver City, Calif. 90230, and Stanton Abrams, 3040 Greenfield Ave., Los Angeles, Calif. 90034

Filed May 6, 1977, Ser. No. 794,556
Int. Cl.[2] F26B *17/24*
U.S. Cl. 34—58 14 Claims

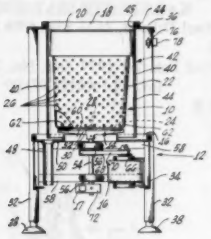
1. An apparatus for drying vegetables comprising;

a basket having water permeable sidewalls for holding the vegetables to be dried;

holding means for rotatably supporting said basket;

means for magnetically attaching said basket to said holding means for rotation therewith;

electric motor means for rotating said basket, whereby water is driven from said vegetables and through said sidewalls by centrifugal force as said basket is rotated; and



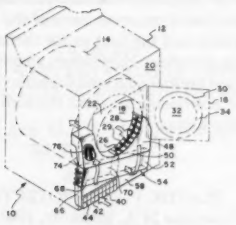
brake means for arresting rotation of said basket including a spring biasing said brake means toward a basket-arresting position and electro-magnetic means for moving said brake means against the bias of said spring when energized.

4,103,433

HOME LAUNDRY DRYER

James R. Taylor, Dallas, Tex., assignor to Q-dot Corporation, Dallas, Tex.

Filed Nov. 8, 1976, Ser. No. 739,815
Int. Cl.[2] F26B *19/00*
U.S. Cl. 34—86 **20 Claims**



1. A home laundry dryer comprising a housing of substantially standard size and, in said housing:

a drum to contain the laundery;

blower means for generating a flow of air entering the drum and a flow of air exhausted therefrom;

a thermal recovery unit, including

a low temperature passage and a high temperature passage, a thermally conductive partition disposed intermediate the low temperature passage and high temperature passage providing fluid isolation of the low temperature passage relative to the high temperature passage while permitting heat transfer from heated air in the high temperature passage to relatively cooler air in the low temperature passage by conduction and radiation through the thermally conductive partition;

a plurality of heat pipes in said passages, each heat pipe extending through said thermally conductive partition and substantially across each of the passages, each pipe having a plurality of fins in contact therewith;

an intake duct connected to direct said entering air to the drum from the outlet of the low temperature duct, whereby the entering air is drawn through the low temperature passage from the inlet thereof;

heater means in the intake duct for heating said entering air; and

an exhaust duct connected to direct said exhausted air to the inlet of the high temperature passage to flow therethrough in a direction opposite to the flow of the entering air in the low temperature passage,

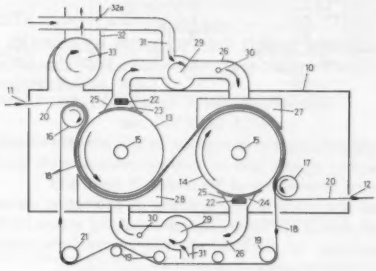
whereby heat can be transferred to the entering air in the low temperature passage from exhausted air in the high temperature passage.

4,103,434

DRYING APPARATUS

Richard Turner Walker, 175 S. Creek Rd., Dee Why 2099 Sydney, Australia

Continuation of Ser. No. 362,490, May 21, 1973, abandoned.
This application Jun. 28, 1976, Ser. No. 700,568
Claims priority, application Australia, May 30, 1972, PA9144
Int. Cl.[2] F26B *13/08*
U.S. Cl. 34—114 **11 Claims**



1. A drying apparatus comprising:

a housing;

a plurality of spaced-apart, imperforate roller means located within the housing with spaced-apart circumferences for supporting a fibrous web of material transported through the housing;

means to introduce fibrous web material to be dried into said housing located adjacent to, but spaced apart from, the first of said roller means;

guide means to direct said fibrous web material to overlie at least a portion of each of said roller means;

means to drive each of said roller means;

heating means to heat the roller means sufficient to expand by vaporization, moisture contained within the fibrous material to be dried; and

web material tensioning means located adjacent to and spaced-apart from the last of said roller means to apply sufficient tension to said web material to permit said web material to be transported through said housing about said roller means and spaced-apart from the periphery thereof by a layer of vapor from said vaporized moisture which discharges from the side of the web adjacent the portion of the roller periphery which would otherwise be contacted at any given time by the material but for the presence of said vapor layer.

4,103,435

HEAD TRACKABLE WIDE ANGLE VISUAL SYSTEM

John W. Herndon, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 8, 1976, Ser. No. 730,892
Int. Cl.[2] G09B *9/08*
U.S. Cl. 35—12 N **25 Claims**

9. A head trackable visual system, comprising in combination:

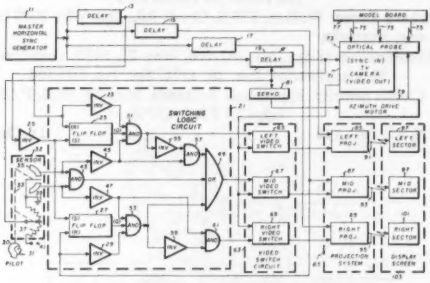
a plurality of means for projecting a like plurality of optical images toward a like plurality of visible sectors of a display screen, respectively, in response to a video signal and a plurality of synchronization signals;

means for generating the aforesaid video signal;

a plurality of switch means respectively connected to the output of said video signal generating means and the video inputs of said plurality of projecting means for timely supplying said video signal thereto, respectively, in response to a plurality of timing signals;

means connected to said plurality of switch means for respectively and selectively supplying said plurality of timing signals thereto in response to said plurality of synchronization signals and in correspondence with predetermined dispositions of the aforesaid head; and

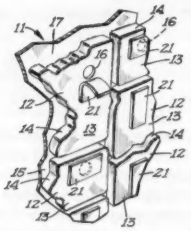
means connected to said plurality of projecting means and said plurality of timing signals supplying means for timely supplying the aforesaid plurality of synchronization signals thereto, respectively.



4,103,436
MAP DISPLAY DEVICE

Thomas Strussion, 4999 Jefferson St., Belaire, Ohio 43906, and Harry D. Moore, Rte. 1, Clarington, Ohio 43915

Filed Jul. 5, 1977, Ser. No. 812,857
Int. Cl.[2] G09B *29/00*
U.S. Cl. 35—40 5 Claims



1. A map display device comprising a substantially rigid boundary defining structure formed from a single piece of rigid, moldable material,

said boundary defining structure having a plurality of recessed portions each being shaped to define a geographical area, each recessed portion including a lower wall and a continuous peripheral wall integral with said lower wall and projecting therefrom,

said boundary defining structure including a plurality of boundary defining surfaces integral with and interconnecting peripheral wall portions of adjacent recessed portions,

the lower wall of each recessed portion having an opening therein,

means for closing each of said openings,

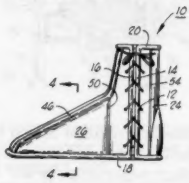
a flowable material filling each recessed portion,

and a transparent, flat recessed cover corresponding in size and shape to said boundary defining structure engaging in sealing relation the boundary defining portions of the boundary defining structure and retaining the flowable material therein.

4,103,437
KARATE COMBAT SHOE

Lawrence Michael Dillard, 2624 SW. 69th St., Oklahoma City, Okla. 73159

Filed Feb. 24, 1977, Ser. No. 771,819
Int. Cl.[2] A41D *17/00*
U.S. Cl. 36—2 R 5 Claims



1. A protective foot covering for use in Karate combat, comprising:

resilient panel means having a bottom edge and being disposed to provide ankle top covering around the inside, instep, outside and heel of the foot;

resilient securing means maintaining said panel means around said foot;

resilient strap means affixed to the bottom edge of said panel means to extend across the sole of the foot;

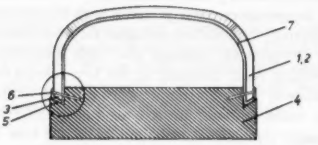
a plurality of additional resilient padding means retained within said panel means at each of the inside sector, the outside sector and the heel sector thereof; and

a tongue flap of padded consistency which is secured to said panel means bottom edge and foldable beneath said instep sector for positioning adjacent the foot instep to provide additional padding.

4,103,438
PLASTIC FOOT PROTECTOR

Frode Fron, Damvegen 24 A, Krakeroy, 1600 Fredrikstad, Norway

Filed Jun. 16, 1976, Ser. No. 696,819
Claims priority, application Norway, Jun. 20, 1975, 752194; Feb. 4, 1976, 760364; Feb. 4, 1976, 760365
Int. Cl.[2] A43B *13/22*
U.S. Cl. 36—72 R 5 Claims



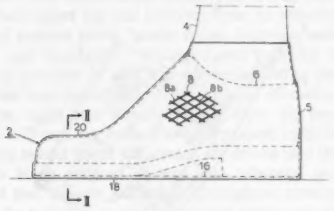
1. A foot protector in combination with footwear comprising a plastic material conforming to the shape of the toe and to the instep part of a foot and including a toe cap portion and an instep cap portion covering the entire instep of the foot, said toe cap portion and instep cap portion including lower parts extending to the sole of the footwear, said toe cap and instep cap portions being shaped to be secured to said footwear sole to prevent the foot protector from pressing against the foot or penetrating into the sole by application of high loads, said lower parts being shaped at an angle of 30° to 75° corresponding to a groove provided in said sole, the lower parts being attached to the sole by rivets or nails, the sole being of wood.

4,103,439

SHOE COVER AND METHOD OF MAKING SAME

Harvey J. Abramson, Tel Aviv, Israel, assignor to Metatech Corporation, Northbrook, Ill.

Filed Sep. 16, 1976, Ser. No. 724,008
Int. Cl.[2] A43B 1/10
U.S. Cl. 36—7.3 4 Claims



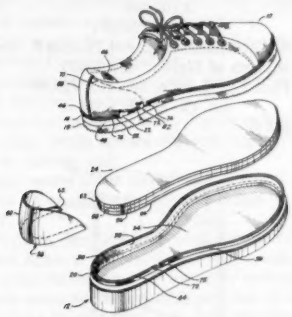
1. A shoe cover for use in dust-free and decontamination rooms, as protective rainwear, or the like, characterized in that the shoe cover is a one-piece unit of thin, pliable, elastic material including a sole portion and a top portion formed in the shape of a foot to tightly enclose the complete wearer's shoe and to extend slightly above and to grip its upper edge, the outer face of the shoe cover being formed with a network of ribs which increase its tensile and shear strength, isolate tears, and reduce slip, said network of ribs including a first plurality of parallel ribs extending in one direction, and a second plurality of parallel ribs intercepting the first plurality of ribs at oblique angles to form diamond-shaped sections having their long dimensions in the longitudinal direction of the shoe cover.

4,103,440

SHOE WITH DETACHABLE UPPER

Peter A. Lawrence, 27215 SE. Duthie Hill Rd., Issaquah, Wash. 98027

Filed Aug. 15, 1977, Ser. No. 824,424
Int. Cl.[2] A43B 3/24
U.S. Cl. 36—101 7 Claims



1. A shoe comprising:

(a) a sole having a tread portion and an upstanding side wall extending around the perimeter of said tread portion;

(b) an upper having a lower edge portion extending around the perimeter of said upper; and,

(c) slide fastener means for detachably connecting said upper to said sole, said slide fastener means including,

(1) a lower stringer comprising a lower stringer mounting tape and first coupler means extending along an edge thereof, said lower stringer mounting tape being attached to the inside surface of said sole side wall and supporting said first coupler means along the perimeter of said sole at an elevation above the top of said sole side wall,

(2) an upper stringer comprising an upper stringer mounting tape and second coupler means extending along an edge thereof, said upper stringer mounting tape being attached to said upper along the outside surface of said lower edge portion of said upper with said second coupler means directed upwardly, said upper stringer tape being folded outwardly and downwardly over on itself both to form an upwardly directed bight and to locate the second coupler means in a depending position laterally outwardly of said upper and above the top of said sole side wall, and

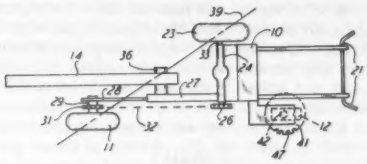
(3) slider means for coupling and uncoupling the first and second coupler means on said lower and said upper stringers.

4,103,441

TRENCHER WITH OFFSET DRIVE WHEELS

James Samuel Flippin, Clearwater, Kans., assignor to J. I. Case Company, Racine, Wis.

Filed May 9, 1977, Ser. No. 794,953
Int. Cl.[2] E02F 5/06
U.S. Cl. 37—86 10 Claims



1. In a trencher for digging a trench in the ground, a mobile trencher including three ground wheels and a powered drive unit and a trencher boom with a digging chain thereon and driven by said drive unit, said trencher boom being pivotally supported about an axis and as an element of said mobile trencher and extending to a free end for penetrating the ground and forming the trench in the ground and with said chain being driven along the length of said boom for digging into the ground, two of said ground wheels being drivingly associated with said drive unit to be traction wheels and to drivingly support said mobile trencher in a fore-and-aft direction of movement, the improvement comprising all of said wheels being located on separate and respective axes offset from each other in the fore-and-aft direction of said mobile trencher and with said two traction wheels being disposed on opposite sides of said trencher and with said three wheels being located at the respective corners of an imaginary triangle in plan view of said trencher, said trencher boom being pivotally supported on a pivot axis located to intersect a vertical plane extending between the said two traction wheels and said trencher boom being pivotally supported at a location within the geometric limits of said imaginary triangle, whereby the forces of said trencher boom on said mobile trencher are neutralized through the location of said two traction wheels.

4,103,442

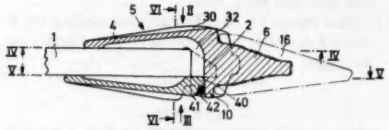
ADJUSTABLE SHOVEL TOOTH CAP HOLDER

Hans-Rudolf Zepf, Hirsackerstrasse 30, Horgen, Switzerland

Filed Apr. 1, 1977, Ser. No. 783,567
Claims priority, application Switzerland, Apr. 12, 1976, 4616/76
Int. Cl.[2] E02F 9/28
U.S. Cl. 37—142 R 7 Claims

1. A shovel tooth cap holder attachable to a shovel blade for supporting a tooth cap replaceably attachable to the tooth holder, the tooth holder comprising

a front portion adapted to receive a tooth cap;
a first rear portion shaped to lie against one surface of the shovel blade;
a transverse web between said front and rear portions, said web having front and rear surfaces and upper and lower ends, said front portion coupled to and extending forwardly from said web front surface, said first rear portion coupled to and extending rearwardly from said web upper end; and
a separately formed second rear portion comprising a hollow shell having parallel legs adapted to lie against the



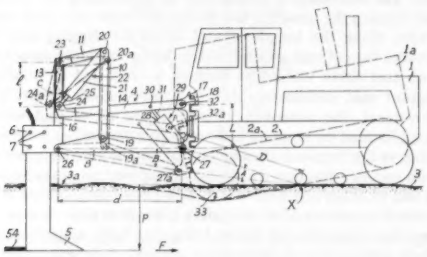
opposite surface of said shovel blade and a front surface shaped to abut only a portion of said web rear surface to permit said front surface of said second rear portion to be located adjacent any portion of said web rear surface to enable the spacing between said first and second rear portions to be varied, said first and second rear portions being fixedly connectable to the respective surfaces of said blade and said second rear portion being fixedly connectable to any portion of said rear surface of said web whereby said holder is attachable to blades of different thicknesses.

4,103,443

LINKAGE FOR AN EXCAVATING TOOTH

Gilles Pelsy, Domaine de l'Epina, Maucourt-sur-Orne, France (55400)

Filed Mar. 31, 1977, Ser. No. 783,465
Claims priority, application France, Apr. 6, 1976, 76 09979
Int. Cl.[2] A01B *13/08;* E02F *5/18*
U.S. Cl. 37—193 **5 Claims**



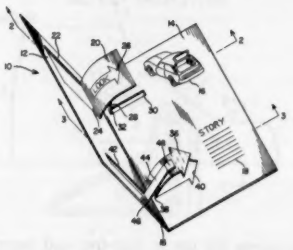
1. Drainage machine apparatus constituted by a structure and by working equipment, said apparatus comprising a tooth mounted on a support and a system of arms articulated about horizontal shafts connecting the support to the structure, wherein the system of arms is formed by first, second and third arms which, in cooperation with the tooth support form an articulated quadrilateral, the first arm being articulated to the support and to the third arm and the third arm also being articulated to the support, wherein the second arm is spaced from the structure, while the first arm is articulated to the structure by a different shaft from that which articulates it to the second arm and the system of arms also comprises fourth and fifth arms articulated to each other wherein additionally the fourth arm is articulated to the third arm and the fifth arm to the structure, and a locking member coupled to the third and fourth arms in such a way as to selectively maintain at a given value the angle formed by the third and fourth arms.

4,103,444

FLAP POP-UP FOR ADVERTISING LEAFLETS

John H. Jones, Westfield; Donald W. Schoenleber, Princeton, and Frederick Grainger, Green Brook, all of N.J., assignors to Beatrice Foods Co., Chicago, Ill.

Filed Dec. 27, 1976, Ser. No. 754,363
Int. Cl.[2] G09F *1/00*
U.S. Cl. 40—124.1 **6 Claims**



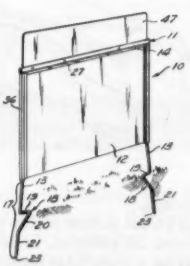
1. An advertising pop-up assembly, comprising:
(a) two rectangular paper sheets joined along a fold line
(b) at least one of the sheets having advertising material on its inside face
(c) a direction indicating element partially cut from and integral with and projecting from one of the sheets and extending outwardly from the fold line with its free end disposed immediately adjacent the advertising material and movable from the plane of the sheet
(d) a partially cut out elongated relatively thin articulating element extending substantially in the same direction as and integrally connected at one end to the central section of the direction indicating element, and
(e) the articulating element having its other end connected to the other sheet at a point spaced from the fold line such that when the two sheets are parted the articulating elements pulls on the direction indicating element and brings it to a position above and adjacent the advertising material to direct the reader's attention thereto.

4,103,445

ROLL-UP SIGN

David A. Smith, 200 Columbus St., and Thomas P. Hertrick, 859 Sherwood Dr., both of Elyria, Ohio 44035

Filed Sep. 2, 1976, Ser. No. 719,687
Int. Cl.[2] G09F *7/00*
U.S. Cl. 40—125 G **11 Claims**



3. A sign for outdoor display comprising a rigid frame and a flexible web for carrying an image, the frame members including an elongated crosspiece and a pair of elongated legs for supporting the crosspiece, said web being constructed of thermoplastic rubber whereby the web is sufficiently flexible to be rolled on itself, means for securing the web to the frame, the upper end portion of each leg being adapted to interengage

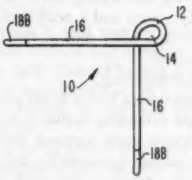
opposite end portions of the crosspiece, means on the end portion of one of said frame members at both ends of said crosspiece for releasably interlocking the respective leg and crosspiece end portions together, said releasable interlocking means being constructed and arranged to permit both locking interengagement and release of said crosspiece and leg end portions while said web is secured to said frame by said securing means, said interlocking means preventing separation of each of said upper leg end portions from its associated crosspiece end portion under tensile forces between such leg end portions and respective crosspiece end portions when the lower end portions of said legs are embedded in the ground, each of said legs including lower end means extending laterally at a slight angle in a direction away from the opposite leg whereby said legs are caused to be separated by ground reaction forces as said lower end means are driven into the ground, said web being secured to said legs whereby said web is stretched and thereby tensioned throughout substantially its full area by said legs as said lower end means are driven into the ground.

4,103,446

FRAMING SYSTEM

Larry Franklin Maglott, 361b Commercial St., Provincetown, Mass. 02657

Filed Jun. 23, 1976, Ser. No. 699,190
Int. Cl.[2] G09F *1/12*
U.S. Cl. 40—155 **9 Claims**



1. A framing system for a rigid assembly including a picture or like item to be exhibited, front and rear major faces and a plurality of corners, said system comprising:

A. bracket means for each corner of the assembly, each of said bracket means including:

i. means disposed adjacent the rear face of the assembly and defining an opening,

ii. first and second arms extending away from said opening defining means toward adjacent edges of the assembly at the corner, and

iii. hook means at the end of each of said first and second arms for engaging the adjacent edges of the assembly; and

B. a one-piece, flexible binder cord for interconnecting said bracket means at the rear face of the assembly, for providing a point for hanging the assembly and for holding said bracket means on the assembly whether or not the assembly is hung by said cord, said cord including:

i. a first end which is secured to said opening defining means in one of said bracket means,

ii. a first intermediate section adjacent said first end which is passed successively through said opening defining means in at least the remaining of said bracket means,

iii. a second intermediate section adjacent said first intermediate section which is looped around a portion of said first intermediate section extending between two of said remaining bracket means to form an inverted "V" shape, and

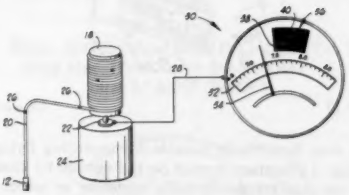
iv. a second end adjacent said second intermediate section which is secured so as to maintain said cord under tension thereby to hold each of said bracket means on the assembly, the apex of the inverted "V" of said second intermediate section providing a rigid, stable, laterally centered point for hanging the assembly.

4,103,447

APPARATUS AND METHODS FOR LOCATING, CATCHING AND RAISING FISH

Loren G. Hill, 1125 Westbrooke Ter., Norman, Okla. 73069

Filed Dec. 29, 1976, Ser. No. 755,249
Int. Cl.[2] A01K *79/00*
U.S. Cl. 43—4.5 **11 Claims**



9. The method of locating and catching a species of fish which prefers a fresh water environment with a pH within a given range, by determining those locations, within a body of fresh water known to be inhabited by the species, which have a pH within the preferred pH range of the species, comprising:

measuring the pH of the water at a plurality of locations within the body of water;

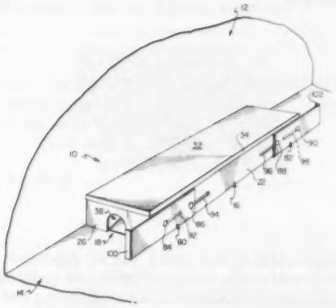
determining which of those locations has a pH closest to the preferred pH range of the species; and placing fish catching means in contact with the water at those locations indicated by the step of determining to have a pH closest to the preferred pH range of the species.

4,103,448

REPEATING ANIMAL TRAP WITH SIDE EXTENSION

Anthony J. Souza, Lancaster, Pa., assignor to Woodstream Corporation, Lititz, Pa.

Filed May 20, 1976, Ser. No. 688,463
Int. Cl.[2] A01M *23/08*
U.S. Cl. 43—67 **3 Claims**



1. In an animal trap including a collection means having parallel side walls, end walls, a top and a bottom and trap means defined in at least one of the end walls, one of the side walls being adapted to be juxtaposed to a wall in a room in which the trap is to be used, the improvement which comprises confining means carried by the other of the side walls of the collection means, said confining means including portions parallel to said other side wall and extendable beyond the point at which said other side wall meets an end wall containing a trap means to direct an animal passing the trap means back toward the trap means.

4,103,449

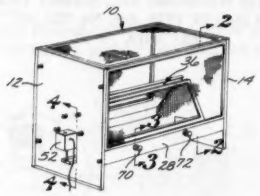
FLY TRAP

Joe M. Z. Vasquez, 122 N. Orange St., Azuza, Calif. 91702

Filed Jul. 26, 1976, Ser. No. 708,585

Int. Cl.[2] A01M *1/10*

U.S. Cl. 43—111 **4 Claims**



1. A trap particularly suitable for capturing flying insects including: a container formed on the outside by closed walls which are structured internally to define an insect entry; a movable food tray positioned beneath said container close enough to said insect entry thereof to cause an insect jumping from said tray to alight near said entry and pass through it into said container; agitating means operatively associated with said food tray; said container having screened top and side walls secured by end walls and upwardly angled, inwardly converging, screened botton walls which extend from the lower inner edges of said side walls to define said insect entry by a predetermined space between their upper edges; said end walls being provided with vertical slots positioned below the entry space defined by said bottom walls; said food tray mounted in said slots in said walls in position for vertical movement therein; and said agitating means connected to said food tray so as to be able to move it at predetermined intervals.

4,103,450

INSECTICIDAL DEVICE

John F. Whitcomb, Mendota, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 645,259, Dec. 29, 1975, abandoned. This application Jul. 5, 1977, Ser. No. 812,631

Int. Cl.[2] A01M *1/20*

U.S. Cl. 43—131 **5 Claims**

1. An insecticidal device which can be deposited in areas infested with undesirable insects and after use easily removed, comprising an insecticidal substance impregnating and coating the fiber surfaces of a lofty, low-density, open non-woven web which will permit the passage therethrough of smaller-size insects such as ants, mites and lice, and has a thickness of at least 0.5 cm thick and a void volume within the range of about 85 to 97 percent, said web being formed of randomly disposed crimped or looped synthetic fibers having a fiber size on the order of 6 to 200 denier and being bonded together at points where they touch and cross, said insecticidal substance being selected from the group consisting of pyrethrum, endrin, aldrin and its epoxide, dieldrin, heptachlor, DDT, BHC, lindane, chlordane, methoxychlor, DDD, TDE, toxaphene, malathion, parathion, TEPP, schradan, demeton, dimethoate, carbaryl and methyl carbamate, organic thiocyanates, haphthalene, paradichlorobenzene, pentachlorophenol, and tetrachlorophenol.

4,103,451

DOLL WITH NECK DETACHABLY SECURED BETWEEN OPPOSED BABY MEANS PORTIONS

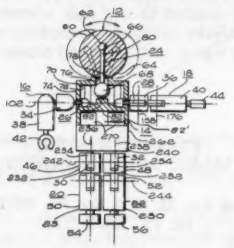
Chikao Kawada, Tokyo, and Toshio Tsuchikura, Koshigaya, both of Japan, assignors to Chikao Kawada, Japan

Filed Apr. 9, 1976, Ser. No. 675,640

Claims priority, application Japan, Apr. 18, 1975, 50-51994; Apr. 18, 1975, 50-51995; Apr. 9, 1975, 50-138003; Apr. 9, 1975, 50-138004; Apr. 9, 1975, 50-138005; Apr. 9, 1975, 50-138006

Int. Cl.[2] A63H *3/00*

U.S. Cl. 46—22 **28 Claims**



1. In an articulated doll arrangement of the type having a head means, a body means and a neck means interconnecting said head means to said body means, the improvement comprising, in combination:

said neck means comprising:

an upper knob portion, a lower knob portion, and an intermediate portion extending between said upper knob portion and said lower knob portions; and

said body means including means for detachably connecting said lower knob portion of said neck means to said body means comprising: a planar surface in a portion of said body means bearing against said lower knob portion of said neck means, neck walls in another portion of said body means defining a neck aperture, and said neck walls engaging said lower knob portion of said neck means in opposed spaced relationship to said planar surface, and said intermediate portion of said neck means extending with clearance through said neck aperture to provide nutational movement of said neck means with respect to said body means.

4,103,452

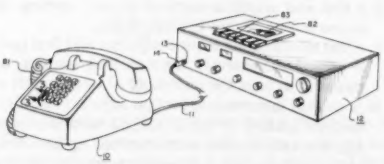
CHILD'S TELEPHONE APPARATUS

Richard G. Wood, 857 E. 3rd South, Salt Lake City, Utah 84102

Filed Dec. 13, 1976, Ser. No. 750,006

Int. Cl.[2] A63H *33/30*

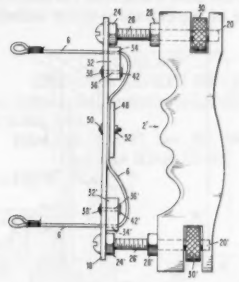
U.S. Cl. 46—33 **5 Claims**



1. A toy telephone having a handset and a base coupled to and selectively supporting said handset, said handset being provided with a first speaker, said base being provided with a second speaker, and first means for coupling separate channels

from an external, audio-signal stereo playback unit to respective ones of said speakers.

4,103,453
ADJUSTABLE U-CONTROL HANDLE
Robert Michael Baron, 834-4th St., Santa Monica, Calif. 90403
Filed Feb. 1, 1977, Ser. No. 764,584
Int. Cl.[2] A63H *27/04*
U.S. Cl. 46—77 **5 Claims**



1. A U-control handle for controlling the flight of a powered airplane by a cable secured to said handle and said airplane comprising:

a member adapted to be gripped by a hand of the person controlling said flight;

two parallel channels in said member, each located respectively at opposite ends of said member;

a movable bolt in each channel having nuts thereon so that each bolt can be individually set in a chosen position and locked in that position by the free hand of the person holding said handle;

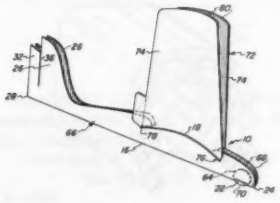
a cross-bar secured to an end of each bolt so that said bar is substantially parallel to said member being gripped;

multiple openings in said cross-bar;

two nylon blocks adjustably lockable along the length of said cross-bar through said openings, and

passageways in said blocks for allowing the passage of said cable therethrough.

4,103,454
FOLDING ASSEMBLED ARTICLE SUCH AS A TOY AIRPLANE
Myron Stone, 188 Polifly Rd., Hackensack, N.J. 07601
Filed May 19, 1977, Ser. No. 798,472
Int. Cl.[2] A63H *27/00*
U.S. Cl. 46—79 **11 Claims**



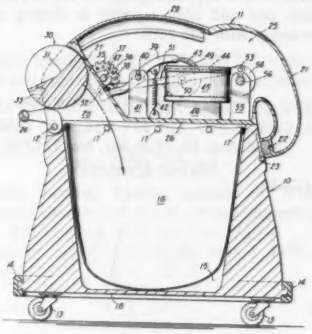
11. In a toy paper airplane having a fuselage extending between a nose portion and a tail portion and including juxtaposed parts folded side-by-side about a longitudinal fold line, an empennage comprising:

a pair of lateral extensions adjacent the tail portion of the fuselage, the lateral extensions being located one on each of the side-by-side parts of the fuselage and being movable into laterally opposite positions, corresponding to the second position of the wing halves, to establish horizontal stabilizers;

a rearmost laterally extending portion at the tail portion of the fuselage; and

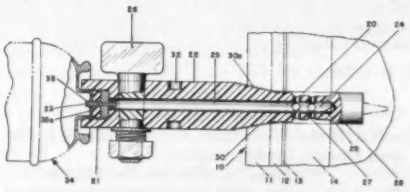
a lateral fold line between the rearmost portion and the lateral extensions, the rearmost portion being foldable about the lateral fold line between a first position rearward of the lateral fold line and a second position forward of the lateral fold line to establish a vertical stabilizer at a selected one of the first and second positions.

4,103,455
TOY CHEST
Robert L. Silvey, 589 Woodland Hills Dr., Athens, Ga. 30601
Filed Mar. 17, 1977, Ser. No. 778,482
Int. Cl.[2] A63H *5/00*
U.S. Cl. 46—99 **12 Claims**



1. A toy chest comprising a base section having an open top storage compartment and a hinged lid section, said lid section having a passage leading into said storage compartment when the lid section is in a closed position, a manually movable toy delivery member on the lid section operable to deliver toys through said passage to said storage compartment, and audio-visual means on said lid section operated by movement of said toy delivery member to reward a child for placing a toy in the toy chest by use of the toy delivery member.

4,103,456
DEVICE AND METHOD FOR TREATING TREES
Dale Z. Hendrixson, 340 Summit Rd., and John C. Macbeth, 224 Summit Rd., both of Springfield, Pa. 19064
Filed Aug. 5, 1976, Ser. No. 711,983
Int. Cl.[2] A01G *29/00*
U.S. Cl. 47—57.5 **7 Claims**



1. Apparatus for use in injecting a fluid into a boring made in a tree for the purpose of treating said tree with said fluid which is fed into said apparatus from a vessel and through said apparatus into said boring, which apparatus comprises a unitary device comprising:

an injector element containing therein a tube affording a

passageway for said fluid through said element, said tube having an inlet and an outlet for said fluid;

said inlet being adapted to being attached directly to said vessel;

said outlet comprising a plurality of apertures in conduit relationship with said tube;

contiguous with said plurality of apertures and positioned on said unitary device between said apertures and said inlet of said tube a tapered, threaded element affording a sealing means with the bark of said tree, thereby to avoid leakage of said fluid out of said boring;

contiguous with said plurality of apertures and at the furthermost position from the inlet a solid element positionable in the innermost end of said boring, thereby affording stability to the mounting of said apparatus in said boring; the apertured outlet portion of said element being of a reduced width with respect to the threaded and solid elements on either end thereof, and

positioned on said apparatus between said tapered, threaded element and said inlet, a valve in closing and opening relationship with said tube.

4,103,457

HORTICULTURAL METHOD AND APPARATUS

Richard S. Carlisle, P.O. Box 307, Rye, N.Y. 10580

Filed Aug. 16, 1976, Ser. No. 714,818

Int. Cl.[2] A01G *1/00*

U.S. Cl. 47—58 **19 Claims**

1. A method of sustaining life processes of a cutting such as a living branch or flower, including the steps of providing in a collapsible reservoir a wholly enclosed supply of liquid suitable for maintaining viability of said cutting and conducting the liquid through an unobstructed liquid delivery and coupling means to essentially all of the cut end of the cutting, the liquid delivery and coupling means including an elastic sleeve of water-impermeable material at the delivery end thereof remote from the collapsible reservoir, and applying said resilient sleeve in tension about all of that portion of the lateral surface of the cutting which is at and adjacent to the cut end of the cutting for forming a leak-preventing cover thereon and the resilient sleeve having a portion extending beyond said cut end, such that only the cut end of the cutting is in contact with the liquid in the extending portion of the elastic sleeve, said reservoir collapsing as the cutting absorbs liquid.

4,103,458

SECURING OF DOORWAYS

Ernest R. Booker, Teddington, England, assignor to Plan Partitions Limited, London, England

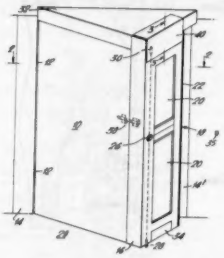
Filed Dec. 14, 1976, Ser. No. 750,389

Claims priority, application United Kingdom, Jun. 21, 1976, 25678/76; Sep. 17, 1976, 38525/76

Int. Cl.[2] E06B *7/08*

U.S. Cl. 49—56 **10 Claims**

1. A doorway comprising a generally rectangular door which is pivotally carried by a door frame in a manner allowing movement of the door over an adjacent floor in one direction only out of the plane of the door frame, the door and the floor and the door frame thus constituting respective elements of a conventional doorway, and the present improvement residing in adapting such a conventional doorway to resist forceful entry by a caller, even after initial opening of the door by an occupant, by providing a non-collapsible canopy extending outwardly from the door frame above the door in combination with a generally rectangular closure member formed as a non-collapsible imperforate bullet-resistant member which extends from the floor to the canopy and which includes at least one translucent portion of a bullet-resistant material, the entire length of one vertical edge of the closure member being pivotally hinged to the door frame with the entire length of the other vertical edge of the closure member including a flange



extending perpendicular to the main portion of the closure member to form therewith an L-section, both upper and lower portions of the closure member carrying respective bolts which are movable into and out of respective sockets set in said canopy and said floor to secure and release the closure member from an operative stationary position, in which the closure member lies at a predetermined position with the flange lying in the path of movement of the door to prevent subsequent opening of the door through more than a predetermined angle, the closure member and the canopy then bridging the gaps which would otherwise have appeared between the door and the door frame so that entry through the doorway by the caller is denied until said bolts have been released by the occupant.

4,103,459

CHANNEL-SHAPED SEALING STRIPS

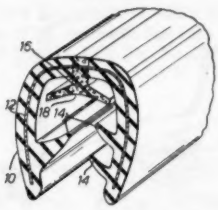
Jean Barnerias, Chartres, France; Anthony E. Johnson, Coventry, England, and Erich Weimar, Viesen, Fed. Rep. of Germany, assignors to Draftex Development AG, Switzerland

Filed Dec. 17, 1976, Ser. No. 751,593

Claims priority, application United Kingdom, Dec. 19, 1975, 52005/75

Int. Cl.[2] E06B *7/16*

U.S. Cl. 49—491 **9 Claims**



1. A channel-shaped sealing strip, comprising

U-shaped metal carrier means,

channel-shaped elastomeric material enclosing the carrier means,

a linear insert of softer elastomeric material in and extending through the thickness of the channel-shaped elastomeric material and running along the base of the channel and being proud of the inside surface of the base, the said insert

being of cellular elastomeric material and being formed integrally with the remainder of the elastomeric material, and

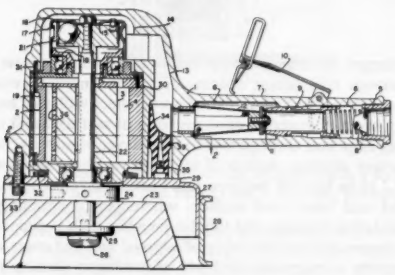
a sealing part attached to and running along the outside of the channel, the sealing part being made of cellular elastomeric material formed integrally with and being an extension of the cellular elastomeric material of the linear insert.

4,103,460

GRINDER SAFETY DEVICE

John P. Law, Athens, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Feb. 2, 1977, Ser. No. 764,724
Int. Cl.[2] B24B *23/00*
U.S. Cl. 51—170 R **7 Claims**



1. A tool guard in combination with a pressure-fluid driven tool comprising:

a tool housing;

a pressure fluid supply connected to said housing;

a pressure-fluid driven motor in said housing communicating with said pressure fluid supply and having its work output on a spindle;

a work engaging means mounted on said spindle;

a guard attached to said housing for at least partially surrounding said work means;

a pressure fluid passage means in said housing communicating with said motor and sealed by said guard; and

removal of said guard permits said passage means to communicate with the atmosphere and thereby vent said pressure fluid to atmosphere.

4,103,461

GRINDING TOOLS FOR CYLINDERS

Alex Besenbruch, Isabela, P.R., assignor to Besenbruch-Hofmann, Inc., Lindenhurst, N.Y.

Filed Aug. 1, 1977, Ser. No. 820,549
Int. Cl.[2] B24B *33/08*
U.S. Cl. 51—352 **9 Claims**

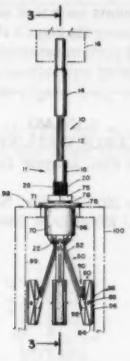
1. A grinding tool for a hollow cylinder having an end wall formed with a central hole, and a cylindrical inner wall to be ground, comprising:

a stem assembly including a cylindrical hub at one end;

a hub member surrounding said hub;

a plurality of flexible legs each having one end engaged on said hub member and having blade portions extending radially outward of said hub member;

a sleeve surrounding said hub member to hold said legs clamped on said hub member; and



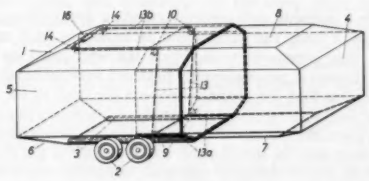
flange means loosely fitting around said hub to be manually gripped and held stationary when said stem assembly, said legs, and said sleeve rotate.

4,103,462

MOBILE HOME

Walter Freller, Sierning, Austria, assignor to "Wohn-Art" - Freizeitartikel Gesellschaft m.b.H., Windischgarsten, Austria

Filed May 4, 1977, Ser. No. 793,748
Claims priority, application Austria, May 5, 1976, 3301/76; Nov. 8, 1976, 8279/76
Int. Cl.[2] E04B *1/346, 7/16*
U.S. Cl. 52—67 **12 Claims**



1. A mobile home comprising

(a) a box-like main part having two side walls, a floor and an end wall interconnecting the side walls, an end of the main part opposite to the end wall being open,

(b) a box-like extension part having two side walls, a rigid floor and an end wall interconnecting the side walls, an end of the extension part opposite to the end wall thereof being received in the open end of the main part,

(c) a guide means in the main part for glidably guiding the extension part in the main part whereby the extension part may be telescopingly moved in the main part between a transport position and an extended position,

(d) wheels supporting the main part for mobility of the home,

(e) a pair of superposed pulleys mounted in the vicinity of each of the side walls of the extension part at the end thereof,

(1) a lower one of the pulleys of each pair cooperating with the guide means and being constituted by rollers capable of running along the guide means for glidably moving the extension part with respect to the main part,

(f) a flexible tensile element trained over each pair of pulleys in zigzag arrangement,

(g) means for anchoring respective end portions of each of the tensile elements respectively in the region of vertical planes extending through the respective ends of the guide

means, the tensile elements being tensioned between the anchoring means in the zigzag arrangement, and

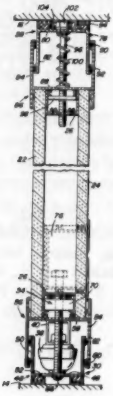
(h) a force-transmitting connection between the end portions of the tensile elements anchored near the end wall of the main part and forming the tensile elements into an endless element, each end portion being immovably connected to the force-transmitting connection.

4,103,463

PORTABLE WALL SYSTEM

Guy E. Dixon, Maimi, Fla., assignor to Panelfold Doors, Inc., Miami, Fla.

Filed Sep. 28, 1976, Ser. No. 727,605
Int. Cl.[2] E04B *2/74*; E04H *3/02*
U.S. Cl. 52—122 **10 Claims**



1. In a portable wall system extending generally vertically between a floor and ceiling and including at least one wall panel, that improvement in which the wall panel includes a fixed dimension panel assembly having a vertical heighth only slightly less than the distance between the floor to the ceiling, a floor engaging supporting assembly on the lower edge of said panel assembly for movably supporting the lower end of the panel assembly for moving the wall panel along the surface of the floor, and a manually operated, vertically extendible and retractable lifting assembly continuously along the bottom edge of said panel assembly for selective vertical orientation above the point of contact between the supporting assembly and the floor surface and below the bottom edge of the supporting assembly, the vertical extension of the assembly serving to lift the panel assembly to bring it into engagement with the ceiling and secure the wall panel between the floor and ceiling, and a spring biased assembly at the upper edge of the panel assembly for engagement with the ceiling, said spring biased assembly including spring means exerting a small upward force to compensate for irregularities in building surfaces and to engage the ceiling with a "light touch".

4,103,464

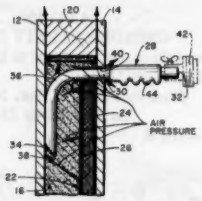
TOOL FOR BLOWING INSULATION INTO AN EXISTING WALL STRUCTURE

Dale L. Clifft, Tarzana, and Melvin G. Green, San Diego, both of Calif., assignors to Melvin G. Green, Inc., San Diego, Calif., a part interest

Filed Feb. 18, 1977, Ser. No. 770,006
Int. Cl.[2] E04G *21/00*
U.S. Cl. 52—127 **4 Claims**

1. In combination with an existing wall structure being formed of an inner wall surface, an outer wall surface, with there being an enlarged opening therebetween, a layer of insulation located within said opening, said layer insulation being composed of a pad of insulative material which is secured to a backing layer of material, said backing layer of material located adjacent said inner wall surface, a tool to facilitate the blowing of additional insulation within said opening, said tool comprising:

an elongated tubular member having an internal chamber to facilitate the passage of blown insulation therethrough, said tubular member having an inner end and an outer end, said inner end adapted to be connected to an insulation blowing machine, said outer end terminating in a cutting edge, said outer end being angularly located with respect to said inner end, an access opening being provided through said outer wall connecting with said internal



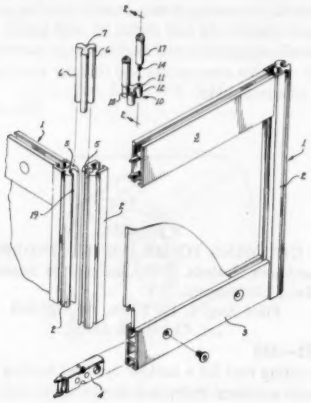
enlarged opening, the outer end of said tool to be inserted through said access opening and to be moved cutting through said pad of insulation into contact with said backing layer of material, upon pivoting of said tool said cutting edge cuts through said backing layer of material until further pivoting motion of said tool results in said outer end to be located between said backing layer of material and said inner wall surface, whereupon conducting of insulation through said tubular member such is deposited between said backing layer of material and said inner wall thereby compressing said pad of insulation thereby permitting a substantial higher quality and greater amount of insulation to be supplied within said opening.

4,103,465

MODULAR PANEL DISPLAY SYSTEM

Leo S. McDonald, Jr., Glenview, Ill., assignor to Greyhound Exhibitgroup, Inc., Elk Grove, Ill.

Filed Aug. 25, 1977, Ser. No. 827,483
Int. Cl.[2] E04C *2/42*; A47G *5/00*; E04B *2/74*
U.S. Cl. 52—127 **6 Claims**



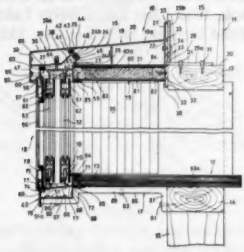
1. A modular display panel system comprising a plurality of panels, each of said panels having a vertical frame on at least one side; at least one vertical post; means defining closely fitting longitudinal mating splines and keyways carried by said post and vertical frames; and means for temporarily and releas-

ably preventing longitudinal movement of said frames relative one another comprising an insert adapted to fit said keyways, an elastomeric material carried by said insert and means for expanding and contracting said elastomer to frictionally engage the walls of said keyways.

4,103,466
BAY WINDOW UNIT

Mitsuo Nagase, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jan. 14, 1977, Ser. No. 759,485
Claims priority, application Japan, Jan. 17, 1976, 51/4129[U]
Int. Cl.[2] E06B *1/38*
U.S. Cl. 52—201 **11 Claims**



1. A bay window unit for covering an opening in a building, said opening having a first header and a first sill, the bay window unit comprising:

(a) a mounting member of L-shaped cross section, one leg of said mounting member being adapted to be fixedly secured to a top surface of the first header;

(b) an overhanging roof decking structure for extending along the length of the first header, said structure being adapted to project outwardly from the first header, said structure including a hollow body of generally rectangular cross section having a pair of generally horizontal upper and lower plates and a pair of vertical inner and outer end plates interconnecting said upper and lower plates at their inner and outer ends, respectively, said structure having a vertical first mounting portion at its inner end adapted to be fixedly secured to the first header, said vertical first mounting portion including said inner end plate fixedly secured to the other leg of said mounting member, and a first vertical flange extending from said inner end plate at its lower edge and adapted to be held against the exterior vertical surface of said first header, said roof decking structure including a second mounting portion at its outer end, and a downwardly facing third mounting portion disposed intermediate said first and second mounting portions;

(c) a generally horizontally extending bracket member for extending along the length of the first sill, said bracket member being adapted to have its inner end secured to an exterior vertical surface of the first sill, said bracket member extending outwardly generally the same distance as said roof decking structure;

(d) an exterior window assembly comprising a frame including a second header and a second sill, and a pair of sashes mounted within said frame in parallel closely spaced planes, said frame being disposed at the outer ends of said roof decking structure and said bracket member, said second header being fixedly secured to said second mounting portion, and said second sill resting on and being fixedly secured to the outer end of said bracket member;

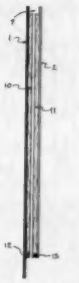
(e) a pair of side board structures extending between said roof decking structure and said bracket member at their opposite sides; and

(f) a head board assembly attached to said third mounting portion, the inner end of said head board assembly being held against and secured to the exterior surface of said first vertical flange.

4,103,467
COMPRESSABLE PREFABRICATED PANEL SECTIONS FOR WOOD FRAME BUILDINGS

Sir Walter Lindal, 1120 Eighth Ave., #1201, Seattle, Wash. 98101

Filed Sep. 16, 1976, Ser. No. 723,753
Int. Cl.[2] E04B *1/74*
U.S. Cl. 52—404 **4 Claims**



1. A prefabricated wood frame wall section for a building wall containing outside siding, inside panelling, insulation and stud and plate framing; the height of the section being the desired building wall height; the thickness of the section being the thickness of the panelling, plus the larger dimension of the framing, plus the thickness of the outside siding, said stud and plate frame consisting of a split vertical stud and split horizontal bottom plate, split lengthwise in the same plane as the section surfaces so that the section is effectively divided in half, with the division of said framing members varying with the relative comparative thickness of the inside panelling and outside siding that is used; said insulation being left uncut and affixed to the internal surface of the inside panelling, the split stud and plate framing parts being fixed to the inside panelling and outside siding section halfs so as to form an "L" with the stud part on the inside panelling half section edge opposing the stud part on the outside siding half section edge and the opposing plate parts being on the bottom of the section, the said split stud parts being attached to their respective half sections so that a small fraction of their edge is exposed malelike to receive the opposite section edge of a similar connecting section and the split bottom plate having the "toe" of the "L" the same fraction short of extending to its section edge to allow the insertion of the male part of another similar section's stud; wherein one half of the divided section has been rotated 180° in its plane causing the "L" framing to form a rectangle and with the framing members of each half overlapping the edges of the opposing panel forming a compressible box in which the insulation has been crushed; said half panels being compressed together and fixed together by packaging and banding into a package approximately half the thickness of the section.

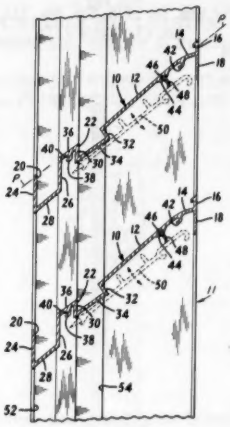
4,103,468
DRAINABLE BLADE LOUVER

Robert W. Olsen, New Providence, N.J., assignor to Construction Specialties, Inc., Cranford, N.J.

Filed Apr. 22, 1977, Ser. No. 790,025
Int. Cl.[2] F24F *13/08*
U.S. Cl. 52—473 **5 Claims**

1. In a louver having a pair of spaced-apart vertical members supporting a multiplicity of elongated horizontally extending inclined blades, each of which is of uniform cross section along its length and has a front edge that is located substantially

below its back edge, and an upwardly open front drainage trough located adjacent the front edge of the blade, the improvement wherein each blade has at least one second upwardly open drainage trough located in at least about the front one-third of the blade closely adjacent the front trough, each such trough being defined by spaced-apart front and back walls, the upper edges of which are located substantially above



a bottom wall of the trough such that the splash from water drops impinging on the bottom walls of the troughs is largely confined to the zones bounded by the walls of the troughs, thereby minimizing entrainment of water in an airflow through the spaces between the blades from front to back, and wherein each vertical member has a vertical drainage channel in register with the corresponding troughs of all blades and receiving water therefrom.

4,103,469

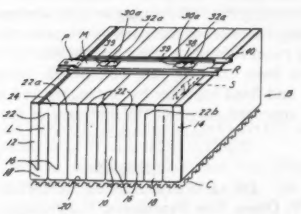
REFRACTORY FIBER BLANKET MODULE FOR FURNACE AREAS WITH HIGH GAS VELOCITIES

Carlisle O. Byrd, Jr., Houston, Tex., assignor to Johns-Manville Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 603,391, Aug. 11, 1975, Pat. No. 4,001,996, which is a continuation-in-part of Ser. No. 475,439, Jun. 3, 1974, Pat. No. 3,952,470. This application Jan. 7, 1977, Ser. No. 757,749

Int. Cl.[2] E04B *1/80;* C04B *43/02*

U.S. Cl. 52—509 **12 Claims**



1. A modular refractory fiber insulating block comprising:

(a) an insulating refractory fiber blanket folded into a plurality of adjacent layers of refractory fiber insulating material and having folds formed between said adjacent layers alternately at outer and inner ends thereof, respectively;

(b) means for attaching said insulating blanket to the wall of the furnace, said means for attaching including a support member mounted in at least one of said outer folds;

(c) said insulating blanket further including inner end portions connecting adjacent layers of said blanket at inner ends thereof to form said inner folds, said inner end portions having fibers transversely disposed to the direction of the heat flow towards the furnace wall to increase the insulating capacity of said insulating block; and

(d) said insulating block having attached to the hot face surface thereof a layer of cloth formed from fibers of metal oxides to prevent erosion of the refractory fibers in said insulating blanket.

4,103,470

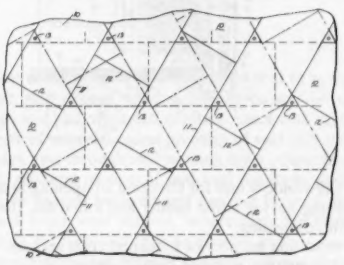
STRESSED SKIN STRUCTURAL DIAPHRAGM

Charles E. Cook, 1515 Lilac La., Liberty Lake, Wash. 99019

Filed Oct. 14, 1976, Ser. No. 732,192

Int. Cl.[2] E04C *2/00*

U.S. Cl. 52—794 **9 Claims**



1. A structural diaphragm, comprising:

a plurality of layers of structural sheet material overlaid on one another across the length and width of an area to be spanned;

each layer comprising a plurality of longitudinal rows of sheet material having parallel side edges extending longitudinally along that area; each of said rows of sheet material being arranged in a co-planar, side-by-side abutting position with respect to the rows of sheet material adjacent to it;

each row of sheet material having a plurality of equally-spaced apertures formed through them along the full length of the row, the apertures being located along at least one line on each row of sheet material, each line being parallel to the side edges of the row containing it, the apertures along each line being offset longitudinally midway between the apertures along each line adjacent to it and the spacing between the lines and apertures being such that any three adjacent apertures form an equilateral triangle;

each layer being superimposed on an adjacent layer with the apertures located thereon coincident with one another and the respective side edges of the rows of sheet material being angularly offset 120° from one another about said apertues.

4,103,471

ATMOSPHERE EXCHANGING AND BAG SEALING MACHINE AND METHOD

Loren L. Lowdermilk, Middletown, N.J., assignor to International Paper Company, New York, N.Y.

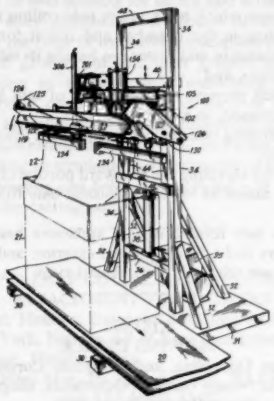
Filed Sep. 1, 1977, Ser. No. 823,333

Int. Cl.[2] B65B *31/06*

U.S. Cl. 53—22 B **41 Claims**

30. A method of heat sealing a bag which is mounted on a machine and wherein a manifold on said machine extends into said bag, said method comprising the steps of:

(a) partially heat sealing bag while said manifold extends into said bag;
(b) temporarily sealing the unsealed portion of said bag around said manifold;

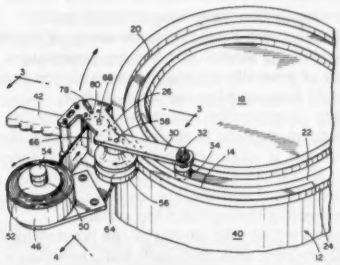


(c) operating on said bag through said manifold; and then
(d) heat sealing the remaining unsealed portion of said bag, while said manifold is still disposed within said bag and thereby forming a complete heat seal of said bag.

4,103,472
MANUAL TAPING DEVICE

Ronald Heringer, Pennsauken, N.J., assignor to Natico, Inc., Chicago, Ill.

Filed Nov. 14, 1977, Ser. No. 851,209
Int. Cl.[2] B65B *61/00*; B32B *31/00*; B44C *7/00*
U.S. Cl. 53—139.3 **14 Claims**

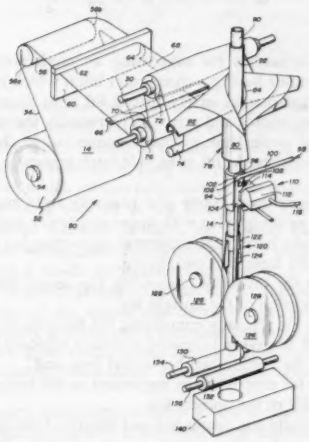


1. A device for taping a cover onto a drum in which the cover has a peripheral rim and the drum has a peripheral lap adapted to be received in fitting relation within the rim when the cover is mounted onto the drum, said taping device comprising a rigid support plate, a first roller mounted for free rotational movement on a rearward portion of the support plate in position to engage the inner surface of the rim when the device is mounted in position of use, a second roller mounted for free rotational movement on a forward portion of the support plate at a level below the first roller and outwardly thereof to engage the outer surface of the drum below the lip when the device is in position of use, a pressure roller mounted for free rotational movement on the support plate between the first roller and the second roller at a level aligned with the rim for engaging the outer walls thereof when the device is in position of use, a tape supply roll mounted for free rotational movement on the support plate outwardly of the pressure roller, and a tension post fixed to the support plate forwardly of a line between the pressure roller and the tape supply roll for engagement by the tape during passage from the supply roll to the pressure roller, and a handle on the support plate.

4,103,473
APPARATUS FOR MAKING A COMPARTMENTED CONTAINER

Bernard John Bast, Bethlehem, and Howard Elias Schaffer, Allentown, both of Pa., assignors to Atlas Powder Company, Dallas, Tex.

Filed Aug. 24, 1977, Ser. No. 827,156
Int. Cl.[2] B65B *9/12*
U.S. Cl. 53—180 M **14 Claims**



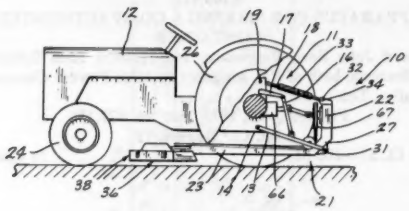
1. An apparatus for making a dual compartmented container, comprising:
a forming anvil including a material supply tube therethrough,
a mandrel supported adjacent to said anvil including a material supply tube and a trailing fin attached thereto, said mandrel and anvil forming a cylinder with a passageway therebetween,
means for feeding a continuous film of material having first and second longitudinal edges toward said anvil and mandrel combination,
means for folding the first edge of the film onto the film to form a two-ply margin on one side of the film about a folded seam,
means for guiding the film around said anvil and mandrel with said mandrel positioned between the layers of the two-ply margin such that the two-ply margin completely encircles said mandrel and with the second edge of the film encircling said anvil and overlapping the outer layer of the two-ply margin,
means for attaching the first edge of the film to the film adjacent therebelow along a continuous first seam to form a first compartment and for attaching the second edge of the film to the outer layer of the two-ply margin intermediate of the fold seam and the first edge of the film along a continuous second seam adjacent the first seam to form a second compartment,
means for filling the compartments with different substances, and
means for gathering and sealing the compartments at spaced lengths along the longitudinal length thereof.

4,103,474

THREE POINT HITCH APPARATUS FOR SUPPORTING AN IMPLEMENT UNDERNEATH A TRACTOR

Simon Bylsma, Temple, Tex., assignor to Continental Belton Co., Belton, Tex.

Filed Apr. 21, 1977, Ser. No. 789,659
Int. Cl.[2] A01B *63/104;* A01D *35/262*
U.S. Cl. 56—15.9 **9 Claims**



7. Hitch apparatus for supporting an implement on and beneath a tractor having a three-point hitch which includes a pair of elongated transversely spaced lift arms pivotally supported on the tractor and extended rearwardly therefrom and an elongated center link pivotally connected to the tractor above and between the lift arms, said hitch apparatus comprising:

(a) an integral main frame of a generally right angle shape having an upright leg with upper and lower portions and a generally horizontal implement supporting leg extended forwardly from said upright leg,

(b) means for pivotally connecting the center link to said upper portion of the upright leg,

(c) means for pivotally connecting the lift arms to the main frame at transversely spaced positions adjacent the juncture of the upright and horizontal legs, and

(d) means for supporting an implement on the horizontal leg forwardly of the upright leg,

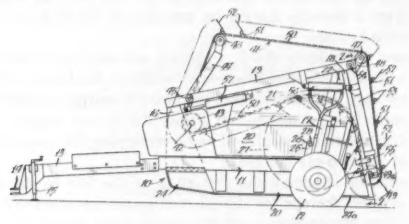
(e) said upright leg, center link and lift arms forming a parallel link system for vertical movement of the implement supporting leg in a horizontally extended position in direct response to up and down movement of the lift arms.

4,103,475

APPARATUS FOR FORMING A BALE OF HAY

Lester R. Kampman; James K. Ulrich, and James H. Hodgson, all of Vinton, Iowa, assignors to Chromalloy American Corporation, New York, N.Y.

Filed Aug. 30, 1976, Ser. No. 719,064
Int. Cl.[2] A01D *75/00*
U.S. Cl. 56—16.4 **10 Claims**



1. Rotary baling apparatus comprising, in combination:

a wheeled frame which is adapted to span a windrow of hay and be moved forwardly therealong;

means defining a baling chamber on said frame which receives the windrow as the apparatus is moved therealong;

a pair of rotatable disks at the sides of the baling chamber which confine the sides of a forming bale, the diameter of said disks being a major fraction of the diameter of a finished bale;

means in said chamber for forming the windrow into a spiral bale as the apparatus is moved forwardly, said means including

endless means which has a lower bale rolling run that may contact hay in the chamber and roll it forwardly, said endless means in said lower run having its sides supported on said disks, and

means which permits at least a part of said lower run to move upwardly as a bale enlarges;

means for driving said endless means so the lower run moves forwardly;

and means for elevating the rearward portion of the chamber defining means to release a finished bale from the chamber,

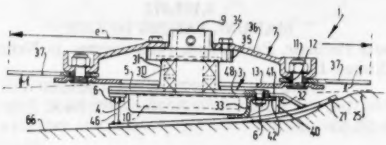
whereby a bale formed in said apparatus has a relatively loose core and a firmly packed exterior, and the sides of the bale are relatively smooth and even.

4,103,476

MOWING DEVICE

Pieter Adriaan Oosterling, and Hendricus Cornelis van Staveren, both of Nieuw-Vennep, Netherlands, assignors to Multinorm B.V., Nieuw-Vennep, Netherlands

Filed Nov. 2, 1976, Ser. No. 737,899
Claims priority, application Netherlands, Nov. 28, 1975, 7513925
Int. Cl.[2] A01D *75/30*
U.S. Cl. 56—13.6 **5 Claims**



1. A mowing device comprising in combination:

an elongate housing extending transversely of the direction of travel of the device, said housing presenting a hollow interior of generally rectangular cross section and having a straight forward edge and a top surface;

a plurality of generally vertical shafts journalled in said housing and disposed in spaced relation along the length thereof and in alignment with each other along a line which is rearwardly offset and parallel to said straight forward edge of said housing, each shaft having an upper end projecting through said top surface;

drive means within said interior of the housing for simultaneously rotating all of said shafts and comprising a straight train of generally horizontal gears spaced ones of which are connected to said shafts;

a plurality of cutting assemblies, one mounted on each of said shafts, each cutting assembly comprising a disc secured to the upper end of an associated shaft, a ring carried by said disc and disposed therebelow, and at least one cutter disposed between said disc and ring, said disc being of inverted dish-like configuration with its central region secured to said shaft and having a peripheral edge which projects forwardly beyond said forward edge of the housing and is located above said top surface, said ring being of annular form and being secured peripherally to the peripheral edge of said disc at a level which is spaced slightly above the level of said forward edge of the housing and having a radial thickness such that the ring overlaps and closely overlies said forward edge of the housing to prevent stones or the like from lodging between the cutting assembly and said top surface of the housing, said cutter extending from between the peripheries of said disc and ring radially outwardly therefrom and substantially per-

pendicular to the axis of its associated shaft to sweep an annular cutting path which projects well forwardly of said forward edge of the housing; and

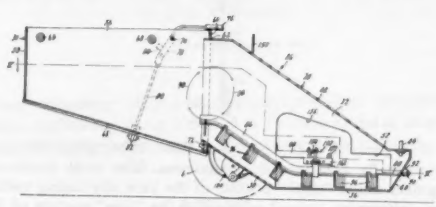
a plurality of ground scanner means each secured to the exterior of said housing for lifting said housing vertically to ride over undulations in ground surface thereby to prevent the rings of the cutting assemblies from penetrating such ground surface, each ground scanner means comprising an elongate shoe underlying said housing substantially directly below the shaft of an associated cutting assembly and having a forwardly projecting portion which extends forwardly and upwardly from beneath the housing to terminate well forwardly of said front edge of the housing and below the periphery of an associated ring of the cutting assembly.

4,103,477

GRASS AND LEAF COLLECTOR AND COMPACTOR ATTACHMENT FOR MOWERS

David Mullet, Hesston; Raymond J. Rilling, Moundridge, and Elmer D. Voth, Newton, all of Kans., assignors to Excel Industries, Inc., Hesston, Kans.

Filed Mar. 25, 1977, Ser. No. 781,336
Int. Cl.² A01D *35/22*
U.S. Cl. 56—202 **10 Claims**



1. In combination with a power propelled mower having cutting blades disposed beneath a hood and operable to eject cuttings through a side opening of said hood, and having groundengaging drive wheels at the sides thereof, said drive wheels being disposed rearwardly of said hood, an attachment for collecting said cuttings comprising:

a. a hollow chute attached to said mower at a side thereof, having a side opening generally registering with the side opening of said hood to receive cuttings therein, and being elongated rearwardly from said side opening,

b. a receptacle supported by said mower rearwardly of said chute, and into which the open rearward end of said chute projects,

c. a cuttings impelling device constituting a paddle bar extending generally longitudinally through said chute, and a series of paddles affixed to said paddle bar generally transversely thereof and in spaced relation along the length thereof,

d. mounting means for said paddle bar whereby it may be pivoted vertically about a horizontal transverse axis at the forward end of said chute, and moved longitudinally of itself within said chute, and

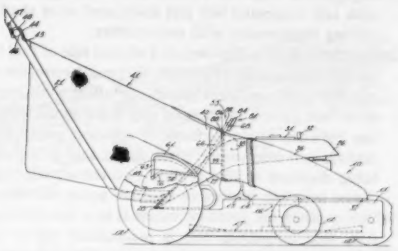
e. a pitman arm connected at its forward end to said paddle bar at a point thereof spaced rearwardly from the pivotal axis thereof, said connection being normally rigid, and rotatably connected at its rearward end to the mower drive wheel at that side of the mower, on an axis parallel with but eccentric to the axis of rotation of said wheel, whereby rotation of said wheel imparts a vertical orbital movement to said paddle bar, said paddles sweeping rearwardly in close proximity to the floor of said chute in the lower portions of their orbits, and moving forwardly in spaced relation above said chute floor in the upper portions of their orbits.

4,103,478

MOWER SUPPORT FOR REAR MOUNTED GRASS CATCHER

Daniel W. Schaefer, Port Washington, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Mar. 3, 1977, Ser. No. 774,515
Int. Cl.² A01D *53/06*
U.S. Cl. 56—205 **4 Claims**



1. In a rear support for a rear mounted grass catching bag of a rotary lawn mower, the lawn mower including

a housing which mounts an engine for driving a rotary blade located within the housing and provided with an engine shroud which substantially encloses the engine and which is movably secured to the housing for movement to a retracted rearward position, the housing having a rearwardly facing grass discharge chute, the lawn mower also having a handle for guiding the mower;

a rear support pivotally connected to the housing rearwardly of the engine and movably between a forward operating position and a rearward retracted position;

a flexible grass catching bag having a grass entrance sleeve releaseably connectible to the mower grass discharge chute;

first means detachably secured to the forward end of said bag and releaseably connectible with said rear support;

second means detachably secured to the rear end of said bag and releasably connectible with the mower handle;

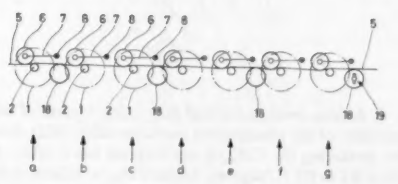
whereby said rear support maintains said grass catching bag in position to receive grass clippings from the mower chute and upon pivotal movement of said rear support to a retracted rearward position, said bag moves with said support collapsing upon itself thereby eliminating the need to dismantle the bag from the support.

4,103,479

TANGENTIAL BELT DRIVE MECHANISM FOR SPINNING ROTORS

Fritz Stahlecker, Josef-Neidhart-Str.18, 7341 Bad Uberkwgen, and Hans Stahlecker, Haldenstrasse 20, 7334 Süssen, both of Fed. Rep. of Germany

Filed Jan. 12, 1977, Ser. No. 758,791
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1976, 2602392
Int. Cl.² D01H *1/241*
U.S. Cl. 57—105 **19 Claims**



1. Apparatus for driving spinning rotors at a plurality of

spinning units of an open-end spinning machine; said apparatus including:

a tangential belt extending adjacent spinning rotor shafts of a plurality of said spinning units,

pressure means for each of said rotor shafts, said pressure means being arranged at a first side of said tangential belt and being movable between a driving position forcing said tangential belt and associated rotor shaft into driving engagement with one another and a non-driving position with said tangential belt and associated rotor shaft out of driving engagement with one another,

and guide members disposed on a second side of said tangential belt opposite said first side, said guide members including belt guide surfaces which are offset with respect to outer belt driven surfaces of said rotor shafts such that a line between guide surfaces of adjacent guide members extends past intervening rotor shafts, said guide members being disposed so that at most two rotor shafts are positioned between respective adjacent guide members,

whereby when the pressure means is in a non-driving position, said tangential belt is maintained out of driving contact with said respective rotor shaft by said guide members,

wherein said rotor shafts includes a plurality of at least three of said rotor shafts disposed side by side with their rotational axes parallel to one another and in a common plane,

and wherein said tangential belt extends parallel to said common plane when in a non-driving position with respect to said rotor shaft.

4,103,480

METHOD FOR PRODUCING TEXTURED FILAMENT YARNS WITH IMPROVED YARN QUALITIES FROM PREORIENTATED POLYAMIDE 6

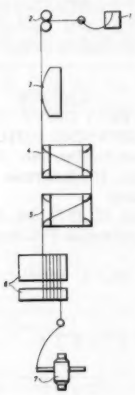
Wolfgang Rellensmann, Dormagen; Michael Bueb, Leverkusen; Lothar Rupprecht, Dormagen; Herbert Schmidt, Dormagen, and Wolfram Wagner, Dormagen, all of Germany, assignors to Bayer Aktiengeseilschaft, Leverkusen, Germany

Filed Mar. 10, 1977, Ser. No. 776,412

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1976, 2610325

Int. Cl.[2] D02G *1/02, 3/04*

U.S. Cl. 57—140 R **4 Claims**



4. A false twist, texturised polyamide 6 yarn, of which the intensity of the standardized meridian reflex (002), determined by measuring the CuK_{α}-X-ray diagram has a value of H_{002} of from 0.2 to 0.9 [1/degree], wherein H_{002} is defined as the intensity of the (002)-reflex in relation to the total surface under the equatorial deviation ($H_{002} = I(002)/_F$).

4,103,481

VARIABLE DIAMETER YARN

Tatjana Vukoje, Dusseldorf, Fed. Rep. of Germany, assignor to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 555,900, Mar. 6, 1975, Pat. No. 4,033,103. This application Mar. 31, 1977, Ser. No. 783,279

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1974, 2411074

Int. Cl.[2] D02G *3/26, 3/34*

U.S. Cl. 57—140 J **10 Claims**

1. A variable diameter "thick-thin" effect yarn having a substantially non-twisted, voluminous, false twist texturized segment as the "thick" portion of the yarn alternating with a less voluminous twisted segment as the "thin" portion of the yarn in which the twist alternates to first run in one S- or Z-direction and then reverses over a zero twist point to run in the opposite direction.

4,103,482

WRISTWATCH HAVING A LIQUID CRYSTAL DISPLAY

Mitsuaki Maruyama, 3-5, 3-chome, Owa Suwa-shi, Nagano-ken, Japan

Filed Mar. 8, 1976, Ser. No. 664,463

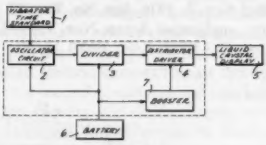
Claims priority, application Japan, Mar. 7, 1975, 50-28460

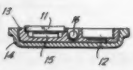
Int. Cl.[2] C09K *3/34;* G02F *1/13;* G04C *3/00*

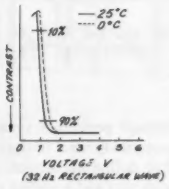
U.S. Cl. 58—23 R **8 Claims**

1. A wristwatch, comprising opposed electrode plates for forming a cell for holding a liquid crystal composition therebetween, said electrode plates having transparent electrodes at the inner surfaces thereof for forming a liquid crystal display, the inner surfaces of said electrode plates being oriented at right angles to each other with respect to the property of aligning adjacent molecules of nematic liquid crystals of high positive dielectric anisotropy, polarizer and analyzer plates sandwiching said electrode plates, a small piezoelectric vibrator to serve as time standard for said wristwatch, electronic circuitry including a complementary type field effect transistor for converting the time standard supplied by said vibrator into indicia in said liquid crystal display, said circuitry being free of a voltage booster, a liquid crystal composition of high positive dielectric anisotropy between said plates, and a single electrochemical cell, said composition having a wide mesomorphic phase including room temperature and being activatable to 90% of saturation at a temperature at least as low as about 9° C by the voltage supplied by said single electrochemical cell, the voltage of said single electrochemical cell being approximately 1.5 V or less, said composition consisting essentially of a majority of at least two p-cyanophenyl-p'-n-alkylbenzoates wherein said alkyl group is from 3 to 8 carbon atoms in length

and enough of a compound of low dielectric anisotropy to lower the crystalline-to-nematic phase temperature at least to as low as about 9° C, said compound being selected from the







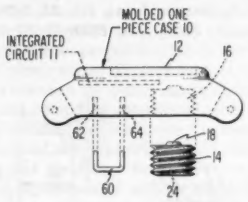
group consisting of p-n-alkoxyphenyl-p'-n-alkyl benzoates where said alkoxy group is from 5 to 7 carbon atoms in length and said alkyl group is from 4 to 7 carbon atoms in length.

4,103,483

ELECTRONIC WRISTWATCH

George Andrew Riley, Rocky Hill, N.J., assignor to RCA Corp., New York, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,367
Int. Cl.[2] G04B *37/0;8;* G04C *3/00;* G04B *19/30*
U.S. Cl. 58—90 R **8 Claims**



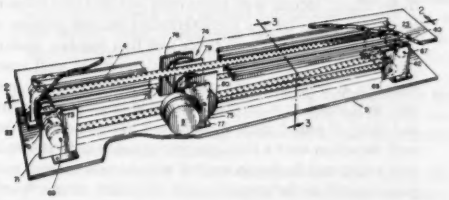
1. A wristwatch comprising, in combination:
a first element comprising an electrical circuit;
a second element comprising an electrooptical display of time, having a surface at which the time may be observed, said electrical circuit connected to said electrooptical display; and
a one piece plastic case and support in intimate contact with the first element over at least a substantial portion of the peripheral surface of said first element and embedding said first element and in intimate contact with a substantial portion of said second element for holding said second element so that its said surface is visible, said case serving as the sole outer case of said wristwatch and serving also as the means for holding the first and second elements immobile with respect to each other without the need for other clamping or holding means, and as the means maintaining them in a desired positional relationship to one another.

4,103,484

TIME INDICATING DEVICE

James R. Bailey, 4020 N. Pioneer Ave., Chicago, Ill. 60634

Filed Jul. 22, 1976, Ser. No. 707,516
Int. Cl.[2] G04B *45/00, 19/02*
U.S. Cl. 58—125 C **2 Claims**



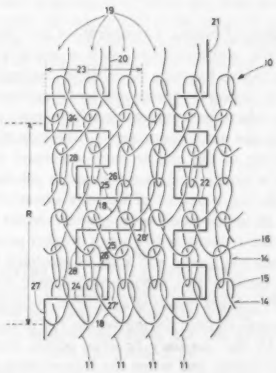
1. A time indicating device comprising one or more endless belts divided into segments of contrasting appearance which meet one another successively end to end, motive means for moving said belts, a face member containing one or more viewing areas through which said segments of said belts are visible, and a rigid elongated guide member for each of said belts adjacent said face member, said guide members having a base to receive the lower sides of said belts, a pair of opposing undercut sides to receive the opposing sides of each of said belts in the undercut portion of said sides with the tops of said sides projecting inwardly and providing an opening above said belts through which said segments are visible, the base of said guide members over which said belts pass being colored and said belts being divided into equal segments which are alternately transparent and opaque, each segment having a length corresponding to the length of the viewing areas in the face member so that the color of said guide members is transmitted through said transparent segments and is visible in its respective viewing area.

4,103,485

ELASTIC WARP-KNIT FABRIC

Friedrich E. Brües, Hilden, Fed. Rep. of Germany, assignor to Gold-Zack Werke AG, Mettmann, Fed. Rep. of Germany

Filed Aug. 30, 1976, Ser. No. 718,618
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1975, 2538776; Jul. 21, 1976, 2632793
Int. Cl.[2] D04B *23/08*
U.S. Cl. 66—192 **10 Claims**



1. A warp-knit fabric comprising:

a multiplicity of longitudinally extending and relatively inelastic warp yarns forming a multiplicity of respective longitudinally extending chains of loops in turn forming longitudinally extending wales and transversely extending courses;

a multiplicity of mainly transversely extending and relatively elastic first yarns each laid into said loops of said warp yarns over only a predetermined first number of said wales; and

a multiplicity of mainly transversely extending and relatively elastic second weft yarns each laid into said loops of said warp yarns over a predetermined second number of said wales equal to at least twice said first number, each of said second weft yarns having a predetermined weft reach equal to at least three of said wales and extending over said weft reach in at least three of said courses in the first and third of which each second weft yarn extends in one weft direction over a third number equal to at least two of said wales and in the second of which each second weft yarn extends in the opposite weft direction over a fourth number smaller than said third number of said wales, said first and second weft yarns all extending in the same direction between adjacent courses.

4,103,486

METHOD OF CONTROLLING TEMPERATURE IN THERMAL REACTOR FOR ENGINE EXHAUST GAS AND IGNITION SYSTEM FOR PERFORMING SAME

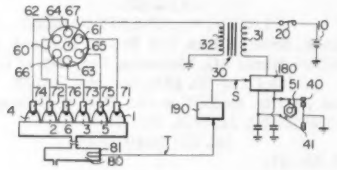
Yoshitaka Hata, Fujisawa; Kenji Masaki, and Kenji Ikeura, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Ltd., Japan

Division of Ser. No. 554,494, Mar. 3, 1975, abandoned. This application Apr. 5, 1976, Ser. No. 673,536

Claims priority, application Japan, Apr. 15, 1974, 49/41911

Int. Cl.[2] F02B *75/10*

U.S. Cl. 60—274 **3 Claims**



1. A method of raising a temperature in a thermal reactor, which reactor communicates with a spark-ignited internal combustion engine having a plurality of combustion chambers for oxidizing carbon monoxide and hydrocarbons in the engine exhaust gas, when the temperature falls below a predetermined temperature, the method comprising the step of retarding the ignition timing of the engine from a normal ignition timing thereof for a portion of total firings in all the combustion chambers during a period of time by connecting a primary winding of an ignition coil in an ignition circuit for the engine alternately and repeatedly to a set of breaker points adjusted to break at a normal timing and a set of auxiliary breaker points adjusted to break with a predetermined time delay from each break of said breaker points at a variable frequency such that a relative amount of time during which the primary winding is connected to the auxiliary breaker points increases as said temperature lowers and when the temperature in the thermal reactor is below the predetermined temperature thereby to raise the temperature of the exhaust gas.

4,103,487

ENGINE EXHAUST PORT LINER SYSTEM

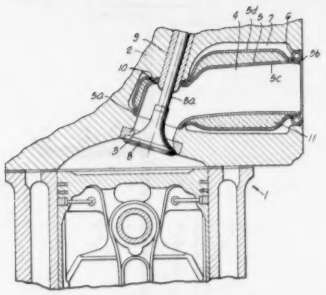
Shuichi Yamazaki; Shinichi Shimada; Yasuhito Sato, and Hiroshi Shirakura, all of Kamifukuoka, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1976, Ser. No. 738,525

Claims priority, application Japan, Nov. 7, 1975, 50-132992

Int. Cl.[2] F01N *3/00*; F02B *23/00*

U.S. Cl. 60—282 **5 Claims**



1. An engine exhaust port liner system comprising a liner rigidly affixed at one end thereof to the exhaust port and being spaced therefrom to define an insulating space between said liner and said exhaust port and a sealing ring disposed about the other end of said liner between said liner and said exhaust port for slidably mounting said other end of said liner on said exhaust port while continually maintaining said insulating space in a substantially airtight disposition during sliding movement of said other end on said exhaust port, wherein said sealing ring is hollow, has a circular cross-section, and is constructed of an elastic, metallic material.

4,103,488

INTERNAL COMBUSTION ENGINE WITH CONTROL SYSTEM FOR SECONDARY AIR SUPPLY

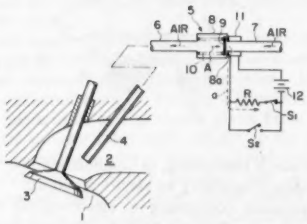
Syunichi Aoyama, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Feb. 22, 1977, Ser. No. 770,764

Claims priority, application Japan, Feb. 23, 1976, 51-17885

Int. Cl.[2] F01N *3/10*; F02B *75/10*

U.S. Cl. 60—289 **9 Claims**



1. An internal combustion engine comprising:

an exhaust system;

a passageway having at one end thereof a nozzle opening to said exhaust system, said passageway having an opposite end thereof communicating with the atmosphere;

a valve means responsive to exhaust pressure in said exhaust system for opening said passageway when said exhaust pressure is relatively low, but closing said passgeway when said exhaust pressure is relatively high, said valve means having a valve member of a material which is movable by influence of magnetic fields and an electro-

magnet means for attracting said valve member towards a valve seat upon passing of electric current therethrough;

first circuit means for permitting a predetermined relatively large electric current to pass through said electromagnet at a first predetermined operating condition of the engine, causing said electromagnet to urge said valve member towards said valve seat to close said passageway; and

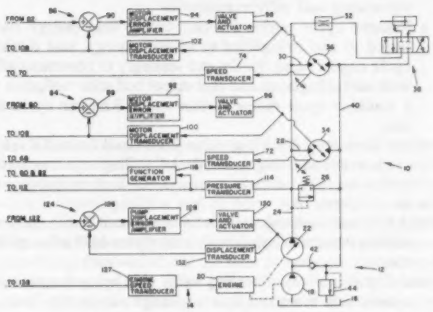
second circuit means for permitting a predetermined relatively small electric current to pass through said electromagnet at a second predetermined operating condition of the engine, causing said electromagnet to urge said valve member towards said valve seat to restrict said passageway, but preventing electric current from passing through said electromagnet at a third predetermined operating condition of the engine.

4,103,489

TOTAL POWER FLUID SYSTEM

Edward Horton Fletcher, Waterloo, and Gordon K. Wiegardt, Cedar Falls, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Apr. 15, 1977, Ser. No. 787,789
Int. Cl.[2] F16H *39/46*
U.S. Cl. 60—395 **34 Claims**



1. A total fluid power system comprising: a variable displacement fluid pump means having an outlet providing a flow of pressurized fluid proportional to pump means displacement; a variable displacement, variable speed fluid motor means having an inlet connected to the pump means outlet and providing a torque output proportional to motor means inlet fluid pressure and motor means displacement; pump control means connected to between the pump means outlet and the motor means inlet and operatively associated with the pump means for changing the displacement thereof in response to changes in the pressure of the pressurized fluid between the pump means outlet and the motor means inlet; and motor control means operatively associated with the motor means for changing the displacement thereof in response to changes in the speed of the motor means due to motor means loading whereby the pump means output flow is changed by changing the pump means displacement so as to maintain the motor means speed and the motor means torque output is changed by changing the motor means displacement so as to match the motor means loading.

4,103,490

APPARATUS FOR HARNESSING TIDAL POWER

Alexander Moiseevich Gorlov, 234 Main St., Brighton, Mass. 02155

Filed Mar. 28, 1977, Ser. No. 781,949
Int. Cl.[2] F03B *13/12*
U.S. Cl. 60—398 **6 Claims**

1. An apparatus for extracting usable power from a tidal water flow, comprising:

means for creating a low, positive pressure air flow in response to a rising tide and a partial vacuum in response to a falling tide;

first and second chambers, the lower portions of which are in fluid combination with each other;

in said chambers, a liquid having a volume approximately equal to half the sum of the volumes of said first and second chambers;

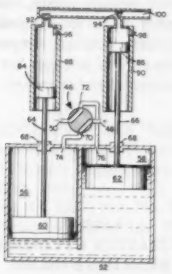
each of said chambers having an inlet/outlet port located near the top thereof;

a multi-state valve for connecting, in a first state, a first input port thereof to a first output port thereof and a second input port thereof to a second output port thereof and, in the second state, connecting the first input port to the second output port and the second input port to the first output port;

the first output port of the valve being connected to the inlet/outlet port of the first chamber and the second output port of the valve being connected to the inlet/outlet port of the second chamber;

each chamber having a float therein, said float being disposed to ride upon the surface of the liquid in the chamber;

the means for creating positive pressure air flow and partial



vacuum being connected to the multi-state valve to supply the positive pressure air flow to a first input port thereof and to supply the partial vacuum to the second input port thereof, whereby the liquid level in each chamber is responsive to the difference in the pressures in the chambers, above the surface of the liquid;

each of said floats being attached to a rod which extends generally vertically through the housing in a fluid-sealed aperture;

the valve being in the first state while the liquid level and float in the first chamber are descending;

means for switching the valve to a second state when the float in the first chamber nears the lower end of its range of travel and, equivalently, when the float in the second chamber nears the upper end of its range of travel;

the valve being in the second state while the liquid level and float in the second chamber are descending;

means for switching the valve to the first state when the liquid in the second chamber nears the lower end of its range of travel and, equivalently, when the float in the first chamber nears the upper end of its range of travel; and

means operable by the reciprocating motion of at least one of said rods to provide output power.

4,103,491

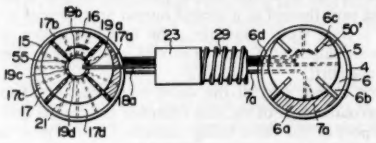
STIRLING CYCLE MACHINE

Yoshihiro Ishizaki, 702 Yamanouchi, Kamakura, Japan

Filed Apr. 26, 1977, Ser. No. 790,904
Claims priority, application Japan, Apr. 28, 1976, 51-48802
Int. Cl.[2] F02G *1/04*
U.S. Cl. 60—519 **11 Claims**

1. A Stirling cycle machine comprising first housing means having first cavity means formed therein, first rotor means

disposed in said first cavity means in the first housing means for defining first chamber means together with the first housing means, said first chamber means having a volume variable in response to rotation of said first rotor means, second housing means having second cavity means formed therein, second rotor means disposed in said second cavity means in the second housing means for defining second chamber means together with the second housing means, said second chamber means having a volume variable in response to rotation of said second



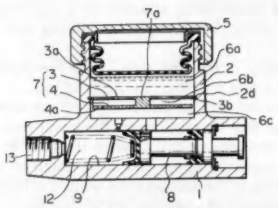
rotor means, means for connecting said first and second rotor means so that they are simultaneously rotated, passage means for connecting the first chamber means with the second chamber means with a predetermined phase difference, regenerator means provided in said passage means, means provided adjacent to the first chamber means for maintaining the first chamber means at a substantially constant temperature, said passage means including a plurality of passages between the regenerator means and the second chamber means.

4,103,492

RESERVOIR IN MASTER CYLINDER OF VEHICLE BRAKING SYSTEM

Takeshi Sakazume, Yokohama, Japan, assignor to Tokico Ltd., Japan

Filed Jul. 27, 1976, Ser. No. 709,104
Claims priority, application Japan, Aug. 7, 1975, 50-96138
Int. Cl.[2] B60T *11/26;* F15B *7/08*
U.S. Cl. 60—588 **5 Claims**



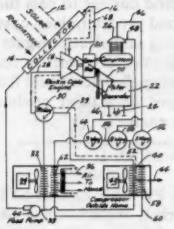
2. A reservoir for a master cylinder of a hydraulic brake system for holding hydraulic brake fluid therein, said reservoir having at least two barrier plates stationarily disposed therein for partitioning the interior thereof into at least three vertically spaced fluid chambers, each of said chambers containing therein fluid, each of said barrier plates extending in a generally horizontal direction across substantially the entire reservoir, each of said barrier plates having extending therethrough a plurality of hole means for allowing restricted fluid flow between adjacent said fluid chambers, said hole means formed in adjacent barrier plates being out of alignment in the vertical direction, and means for rigidly connecting together at least two adjacent barrier plates to thereby form a barrier plate assembly, said connecting means comprising a solid plug connecting said adjacent barrier plates substantially centrally thereof.

4,103,493

SOLAR POWER SYSTEM

James L. Schoenfelder, Coralville, Iowa, assignor to Hansen, Lind, Meyer, Iowa City, Iowa

Filed Mar. 6, 1975, Ser. No. 556,008
Int. Cl.[2] F03G *7/02;* F24J *3/02*
U.S. Cl. 60—641 **6 Claims**



1. A solar system comprising,

a direct boil solar collector for gathering solar energy, converting said solar energy to heat energy, and transfer of said heat energy to a refrigerant within said collector, and vaporizing said refrigerant;

a Rankine cycle engine for converting heat energy transferred to said refrigerant to kinetic energy, said Rankine cycle engine being fluidly and sealingly in communication with said refrigerant and said direct boil solar collector via a Rankine cycle entrance line and a Rankine cycle exit line,

a first three-way diverting valve positioned on said Rankine cycle exit line being in fluid and sealing communication with a first heat exchange means, for heat exchange with an air space,

said first heat exchange means having an exit line in fluid and sealing communication with said direct boil solar collector,

said first three-way diverting value also being in communication with a second heat exchange means, for heat exchange with a second air space,

said second heat exchange means having an exit line in fluid and sealing communication with said direct boil solar collector, a generator;

a heat pump system; and

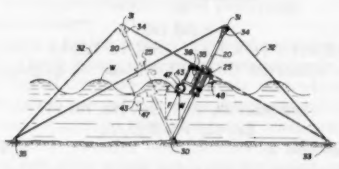
means connected to said Rankine cycle engine to selectively transfer said kinetic energy from said Rankine cycle engine to said generator or said heat pump system, whereby in times of solar energy generation said solar energy may be used for heating or cooling said first air space via said heat pumps system and the heated refrigerant passing through said Rankine cycle exit line or alternatively for generating electrical current.

4,103,494

WAVE AND TIDE MOTOR

Hubert Tidwell, Box 57, Wellington, Utah 84542

Filed Apr. 25, 1977, Ser. No. 790,557
Int. Cl.[2] F03G *7/00*
U.S. Cl. 60—648 **8 Claims**



1. A wave and tide motor comprising a support boom, means

to pivotally anchor one end of said boom to the ocean bottom, whereby the boom can be adjusted angularly on its pivot axis in relation to incoming or outgoing tidal flow, a main frame on said boom, a sub-frame movably mounted on the main frame, a float carried by the sub-frame and adapted to respond to impingement forces on the float due to tidal flow and wave action whereby a resultant impingement force on the float will move the sub-frame in one direction along the main frame, the sub-frame moving in the opposite direction along the main frame under the influence of gravity, and coating means on the main frame and sub-frame for converting linear reciprocation of the sub-frame into rotational movement of a shaft.

4,103,495

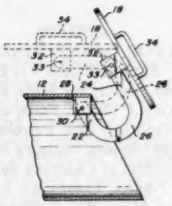
FLOW CONTROL DEVICE FOR AN IRRIGATION DITCH

Gordon L. Graham, Glasgow, Mont., assignor to Richard Rhode, Glasgow, Mont., a part interest

Filed Sep. 9, 1976, Ser. No. 721,731

Int. Cl.[2] E02B *7/40*; F16K *51/00*

U.S. Cl. 61—12 **5 Claims**



1. A device for controlling water flow from an irrigation ditch to an adjacent field comprising, a conduit having an inlet end opening into said field, a cover for said inlet end moveable between a closed position and an open position, hinge means connecting said cover to said conduit for movement between said open and closed positions, said cover when in said open position being disposed above the inlet end of said conduit, said hinge means comprising a "J"-shaped bar which is pivotably attached at one end to the inner top portion of said inlet end of said conduit and attached at the other end to said cover.

4,103,496

COLLAPSIBLE AND EXPANSIBLE BARRAGE

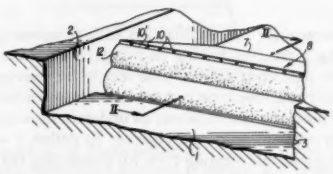
Arturo Colamussi, and Vittorio Merli, both of Ferrara, Italy, assignors to Pirelli Furlanis - Applicazioni Idrauliche Agricole Gomma S.p.A., Milan, Italy

Filed Apr. 11, 1977, Ser. No. 786,558

Claims priority, application Italy, Apr. 15, 1976, 9004 A/76; Dec. 30, 1976, 30986 A/76

Int. Cl.[2] E02B *7/40*

U.S. Cl. 61—27 **10 Claims**



1. A collapsible and expansible barrage, comprising:

a threshold structure on the bottom of a waterway to be dammed-up, provided with a hollow recess for housing the barrage itself in its collapsible state

a metallic flap provided with an air-tank, open along its side that is turned towards the threshold structure, when the barrage is in its expanded state, said metallic flap being hinged along one of its own edges to the threshold structure

a flexible sheet fixed by one of its borders to the metallic flap, and with its other border fixed down to the threshold structure

means being housed in the threshold structure, for extracting and admitting water under pressure in the enclosed space defined by the threshold structure, the metallic flap, and the flexible sheet

means being housed in the threshold structure for admitting air into the air-tank by means of the air-tank opening that is turned towards the threshold structure

at least one flexible member provided with at least one damping element, connecting the threshold structure with the metallic flap whereby the configuration of the barrage in its expanded state is non-modifiable by strain and fatigue stresses in the flexible sheet.

4,103,497

MANOEUVRABLE WEIR

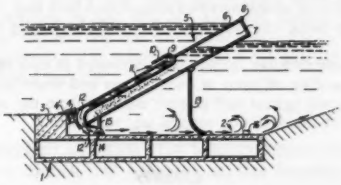
Arturo Colamussi, and Vittorio Merli, both of Ferrara, Italy, assignors to Pirelli Furlanis - Applicazioni Idrauliche Agricole Gomma S.p.A., Milan, Italy

Filed Apr. 11, 1977, Ser. No. 786,552

Claims priority, application Italy, Apr. 28, 1976, 9005 A/76; May 14, 1976, 9008 A/76

Int. Cl.[2] E02B *7/40*

U.S. Cl. 61—27 **5 Claims**



1. A weir for damming water in a waterway comprising a base member disposed on the bottom of the waterway and a pivotable flap member having a wall enclosing an elongated space adapted to contain air under pressure, said flap member having one end wall hinged to the base member and an opposite end wall disposed above the base member and having one sidewall which faces the base member and an opposite sidewall, said flap member being inclined upwardly from its hinged end above the base member, means in said wall adjacent to said opposite end for relieving pressure in said elongated space, a plurality of spaced first openings in said opposite side of the said wall member, conduit means disposed in said elongated space adjacent said opposite sidewall and connected to each of said first openings, means external of the said opposite wall protecting each of said first openings, an elbow curved portion in the wall of each conduit adjacent said hinged end of the flap member and having a second open end to permit water flowing through the said first openings and conduit to flow out into the waterway below the flap member, means for checking flow of water into the conduit through said second opening, and means for admitting air under pressure into the said elongated space.

4,103,498

PLUGS FOR BORES IN ROCKS OR THE LIKE

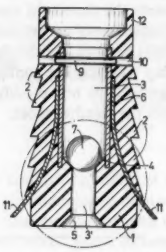
Wilhelm Steinborn, Remscheid, and Alois Mechenbier, Illingen, both of Germany, assignors to Diehl, Nuremberg and Tip-Top-Saar Gesellschaft fur industrielle Vulkanisierung m/b/H., Sulzbach-Altenwald d, both of Germany

Filed Jul. 18, 1977, Ser. No. 816,861

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1976, 2633434

Int. Cl.[2] E21D *21/00*

U.S. Cl. 61—45 B **20 Claims**



1. A plug adapted to be introduced into a bore in rock or the like, which comprises:

a section of elastically deformable material, said section having a front end, a back end, and a lateral surface area, said front end being adapted to enter the rock bore to be plugged prior to any other portion of said plug, the outer diameter of said section roughly corresponding to the diameter of said rock bore to be plugged, the outer peripheral surface area of said plug tapering slightly mainly toward said front end;

grabbing elements provided on at least a portion of said peripheral surface area, said grabbing elements being adapted to frictionally engage the inner surface of the rock bore to be plugged for securely holding said plug therein, the inside of said plug being provided with an axial bore which narrows toward said back end, said axial bore being adapted to receive a self-hardening material; and

a closure member displaceably arranged in said axial bore for sealing off same at its narrower end when pressure is directed against said closure member from the said front end in the direction toward said rear end.

4,103,499

METHOD OF FORMING A WATER BARRIER AROUND FOUNDATIONS

Arthur G. Clem, Des Plaines, Ill., assignor to American Colloid Company, Skokie, Ill.

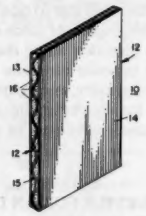
Division of Ser. No. 626,572, Oct. 28, 1975, Pat. No. 4,048,373, Continuation-in-part of Ser. No. 472,668, May 23, 1974, Pat. No. 3,949,560. This application May 25, 1977, Ser. No. 800,475

Int. Cl.[2] E02D *3/14*; B23B *19/00*

U.S. Cl. 61—50 **2 Claims**

1. A method of forming a water barrier around an inground foundation comprising,

removing soil from the location where the inground foundation is to be formed, constructing a foundation in the location from which the soil was removed, locating a panel against the foundation and backfilling on the other side of the panel, said panel containing a soil sealant composition comprising bentonite; a water-soluble dispersing agent selected from the group consisting of a water-soluble salt of acetic acid, a water-soluble salt of phosphoric acid, and a water-soluble salt of boric acid; and a water-soluble polymer selected from the group consisting of polyacrylic acid, water-soluble salts of polyacrylic acid, hydrolyzed polyacrylonitrile, polyvinyl acetate, polyvinyl alcohol, copolymers of the foregoing, and a copolymer of acrylic acid and maleic anhydride, the amount of water-soluble polymer in said soil sealant composition being from 0.1% to 3.0%, by weight, and the amount of



water-soluble dispersing agent in said soil sealant composition being from 0.1% to 3.0%, by weight, and filling said void space.

4,103,500

APPARATUS FOR CONNECTING THE ENDS OF SUBMERGED PIPES

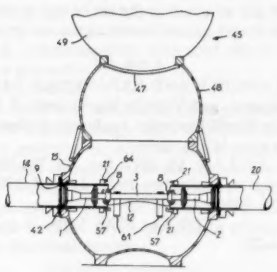
Philippe C. Nobileau, Neuilly sur Seine; Rene M. Dermy, Courcouronnes, and Guy J. Fleury, Paris, all of France, assignors to Compagnie Francaise des Petroles, Societe Anonyme; Etudes Petrolieres Marines, Societe a Responsabilite Limitee, both of Paris; Ateliers et Chantiers de Bretagne-A.C.B., Societe Anonyme, Nantes; Compagnie Maritime d'Expertises, Societe Anonyme, Marseilles; Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines (DORIS) Societe Anonyme, Paris and Societe Nationale Elf Aquitaine (Production), Courbevoie, all of, France

Division of Ser. No. 750,315, Dec. 14, 1976, Pat. No. 4,068,491. This application Aug. 9, 1977, Ser. No. 823,076

Claims priority, application France, Dec. 19, 1975, 75 38988

Int. Cl.[2] F16L *1/04*

U.S. Cl. 61—69 R **8 Claims**



1. Apparatus for connecting two ends of submerged pipes comprising a receiver having two aligned apertures through which the pipe ends extend, jack means for moving the receiver relative to one pipe end to assist in the introduction of the other pipe into said receiver, an undersea intervention unit detactably secured onto said receiver to define a watertight enclosure for an intervention crew for connecting the two ends of the pipes by means of a sleeve, first seal means between the outer surfaces of the pipes and the apertures in the receiver, a stopper having second seal means disposed within the end of each pipe, a first boom detactably connected to said stoppers for holding said stoppers apart, a sleeve having a length equal to the gap between the ends of the pipes, a replacement boom disposed inside said sleeve, and movable sleeve support means for placing the sleeve in position between the pipe ends under remote control for simultaneous replacement of the first boom

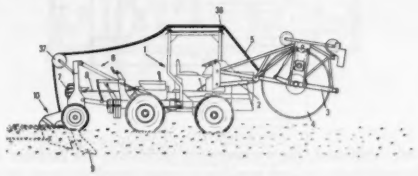
by the replacement boom while the receiver is under hydrostatic pressure to balance the pressures being exerted upon the faces of the stoppers.

4,103,501

DEVICE FOR EMBEDDING FLEXIBLE ELEMENTS OF GREAT LENGTH IN THE GROUND

Jean Laurent, Morainvilliers, France, assignor to Institut Francais du Petrole, France

Filed Jun. 8, 1976, Ser. No. 693,957
Claims priority, application France, Jun. 11, 1975, 75 18478
Int. Cl.[2] A01B *3/64;* E02F *3/62;* F16L *1/00*
U.S. Cl. 61—72.6 **10 Claims**



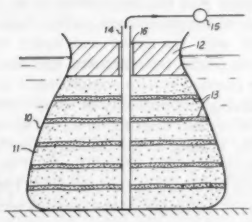
1. A device for embedding flexible elements of great length in the ground, comprising means for handling said flexible elements; means for digging a trench into the ground, said digging means including a vibrating tool; guiding means including at least one guide member for guiding the flexible elements to the bottom of the trench, wherein at least a portion of said guide member includes a guiding path, said portion of said guide member having a wall portion which is linearly displaceable in translation with respect to said guiding path as a result of variations of cross-section of said flexible elements; and means for suspending said guide member from said vibrating tool, wherein suspending means includes constituted by elastic material for dampening vibrations imparted from said vibrating tool to said guide member.

4,103,502

PRODUCTION OF ARTIFICIAL ISLANDS

Patrick Michael Cashman, London, England, assignor to Sykes Construction Services Limited, London, England

Filed Jun. 3, 1977, Ser. No. 803,252
Claims priority, application United Kingdom, Jun. 9, 1976, 23930/76
Int. Cl.[2] E02D *21/00;* E02B *1/00*
U.S. Cl. 61—86 **10 Claims**



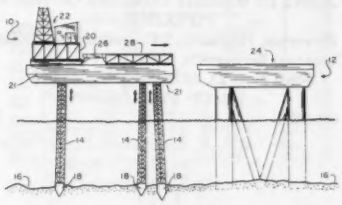
1. In a method of constructing an artificial island in which sand or other permeable material is placed in a flexible envelope and suction is applied to the interior of the envelope to extract water and reduce pressure whereby the hydrostatic pressure of the surrounding water acts to rigidify the material in the envelope, the improvement wherein relatively coarse material is introduced initially to form a drainage layer at the bottom of the envelope, at least one extraction and suction pipe is introduced to extend downwardly to the bottom drainage layer, and at least one drainage tube is introduced to extend downwardly towards the bottom drainage layer, the drainage tube has perforations along its length, and closure means are moved upwardly along said tube during material filling to connect said perforations in succession with said bottom drainage layer from which water is extracted.

4,103,503

DRILLING SUBSTRUCTURE TRANSFER SYSTEM

Marvin L. Smith, Houston, Tex., assignor to Dixilyn International, Inc., Houston, Tex.

Filed Dec. 21, 1976, Ser. No. 753,092
Int. Cl.[2] E02D *25/00*
U.S. Cl. 61—97 **12 Claims**



1. An apparatus for transferring an oil or gas drilling apparatus from a jack-up rig to a fixed platform which apparatus comprises:

a substructure capable of supporting a drilling apparatus;

b. a structural bridge connectable to said substructure;

c. a structural skid mat connectable to the opposite end portion of said structural bridge from the portion of said bridge connectable to said substructure, said substructure, said bridge, and said skid mat connectable in a manner which allows said substructure, said bridge and said skid mat to be skidded on the surface of the jack-up rig to a position placing said skid mat on the fixed platform, said substructure remaining on said jack-up rig; and;

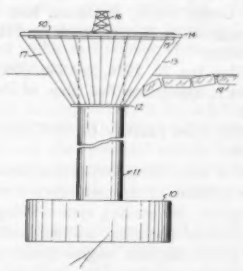
d. connection means on said bridge for connecting said bridge to a side deck portion of the jack-up rig, the top portion of said bridge being substantially level with the top portions of said skid mat and said jack-up rig, said bridge and said skid mat when so connected being capable of supporting said substructure with a contained drilling apparatus thereon.

4,103,504

OFFSHORE PLATFORM FOR ICE-COVERED WATERS

Norman A. Ehrlich, 138 A Eureka St., San Francisco, Calif. 94114

Filed Oct. 7, 1977, Ser. No. 840,275
Int. Cl.[2] E02D *31/00;* E02B *15/02*
U.S. Cl. 61—102 **4 Claims**



1. An offshore platform for resisting external ice forces and for supporting a deck and equipment comprising:

(a) a base,

(b) a support extending vertically from the base,

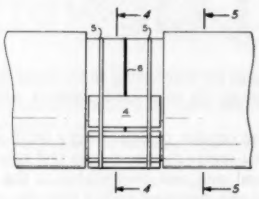
(c) a deck mounted on top of the support,
(d) means attached to the deck for securing cables,
(e) means attached to the support for securing cables,
(f) a plurality of cables attached to the deck securing means at one end and the support securing means at the other end,
(g) means for vibrating the securing means at either ends of the cable whereby the cables are caused to vibrate,
(h) means for adjusting the tension in the cables.

4,103,505

TEMPORARY PROTECTION OR BLOCKING FOR FIELD JOINT IN WEIGHT COATING ON SEA FLOOR PIPELINE

John M. Howerton, Newberry, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 22, 1976, Ser. No. 744,055
Int. Cl.[2] F16L *1/04*
U.S. Cl. 61—108 **2 Claims**



1. A method of at least temporarily releasing the end of a coated pipeline from a pipelaying means on to the bottom of the sea bed, as when pipelaying must be temporarily discontinued, and when there are in the coating of the pipeline, as at welded ends of sections of pipe constituting said pipeline, gaps or a discontinuum in the coating thereon which have not yet been filled with a permanent coating, while protecting against damage to the coating as the gap or discontinuum presenting portion passes over rollers or a stinger which comprises temporarily filling the discontinuum with a temporary filler of the same approximate thickness as the coating in a manner to provide a continuum or even surface to prevent damage of the coated end as it passes over the rollers or stinger, said temporary filler being composed of pieces of wood banded together by at least one steel band.

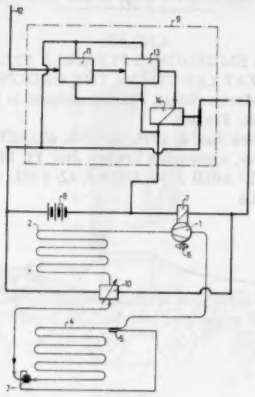
4,103,506

METHOD AND ARRANGEMENT FOR CONTROLLING THE OPERATION OF A COOLING SYSTEM IN AN AUTOMOTIVE VEHICLE

Gerhard Adalbert, Campinas, Brazil; Jürgen Hess, Baden-Baden, and Ulrich Hecht, Bühlertal, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 20, 1976, Ser. No. 650,762
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1975, 2502184
Int. Cl.[2] B60H *3/04*; F25B *1/00*; F01C *11/00*; F03C *3/00*
U.S. Cl. 62—61 **4 Claims**

1. A method of controlling the cooling power of the cooling system of the interior of the passenger compartment of an automotive vehicle, the cooling system being of the type including a cyclically operating cooling-medium compressor producing at low to medium engine speeds a cooling power sufficient to satisfactorily cool the interior of the passenger compartment, the method comprising the steps of using speed-measuring means to generate an engine-speed-dependent signal whose value is dependent upon engine speed; and, by applying the engine-speed-dependent signal to a volumetric-throughput adjusting means for the compressor, decreasing the cooling power of the cooling system at higher engine speeds by decreasing the per-cycle volumetric throughput of the compressor.

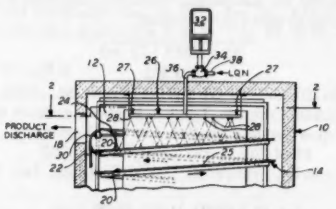


4,103,507

HIGH SPEED FREEZING SYSTEM

Hugues G. Benois, Reinach, Switzerland, assignor to Airco, Inc., Montvale, N.J.

Continuation of Ser. No. 594,928, Jul. 10, 1975, abandoned. This application Jun. 17, 1977, Ser. No. 807,621
Int. Cl.[2] F25D *13/02*
U.S. Cl. 62—63 **6 Claims**



1. A high-rate freezing system of the kind having an insulating housing forming a freezing compartment with an entrance port and a discharge port for the product to be frozen, and a product conveyor of the porous belt vertical helix type within the compartment with the lower and upper terminal tiers thereof located opposite the entrance and discharge ports respectively, the freezing system comprising:

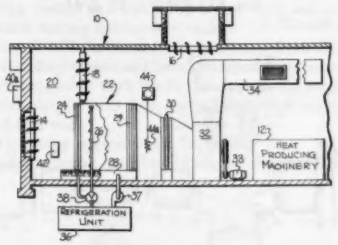
(a) a header having a multiplicity of spray nozzles grouped in compact array and disposed in an arc along and above the upper tier leading to the discharge port, the arcuate array spanning a partial circumferential section of the upper tier and the nozzle spray patterns of the array merging throughout the length of the spanned section, thereby covering the tier area spanned,
(b) a source of liquid nitrogen connected through a control valve to the header and spray nozzles,
(c) flow control means for adjusting the control valve according to a pre-set compartment freezing temperature to cause the liquid nitrogen spray to be concentrated on and to flood the spanned section area, thereby establishing on the upper tier a single high-rate heat transfer zone in advance of the discharge port, and
(d) guiding means at the lower tier for causing used nitrogen vapor drawn by induction through the entrance port to flow over and pre-cool the entering product.

4,103,508

METHOD AND APPARATUS FOR CONDITIONING AIR

Hugh C. Apple, 2023 Lynwood Dr., Greensboro, N.C. 27406

Filed Feb. 4, 1977, Ser. No. 765,746
Int. Cl.[2] F25D *17/06, 23/00;* F24F *3/14;* B01F *3/02*
U.S. Cl. 62—92 12 Claims



1. A method for providing temperature and humidity controlled air to an enclosed space to achieve desired conditions of temperature and humidity therein, and which is characterized by the maximum use of the outside air for cooling purposes to thereby minimize the load on the refrigeration unit and while insuring a predetermined minimum load on the refrigeration unit during periods of its operation to thereby avoid undesirable cycling of the unit, and comprising

(a) during conditions wherein the outside air has a wet bulb temperature in a predetermined range immediately above the dew point temperature of air at the desired conditions of temperature and humidity, the steps of:

(1) introducing outside air and return air from the enclosed space into a mixing chamber,

(2) conveying the air from the mixing chamber through an air washer while cooling the same with a refrigeration unit to an extent such that the wet bulb temperature of the mixed air approximately equals the dew point temperature of air at the desired conditions of temperature and humidity,

(3) controlling the proportions of the outside air and return air being introduced into the mixing chamber such that the total heat of the mixed air is only sufficient to permit the continuous operation of the refrigeration unit in cooling the mixed air as recited in step 2, and

(4) conveying the mixed and saturated air resulting from steps 1–3 into the enclosed space, and

(b) during conditions wherein the outside air has a wet bulb temperature between the highest temperature in said predetermined range and the wet bulb temperature of air at the desired conditions of temperature and humidity, the steps of:

(5) introducing substantially only outside air into the mixing chamber,

(6) conveying the air from the mixing chamber through the air washer while saturating the mixed air and cooling the same with the refrigeration unit to an extent such that the wet bulb temperature thereof approximately equals the dew point temperature of air at the desired conditions of temperature and humidity, and

(7) conveying the mixed and saturated air resulting from steps 5–6 into the enclosed space.

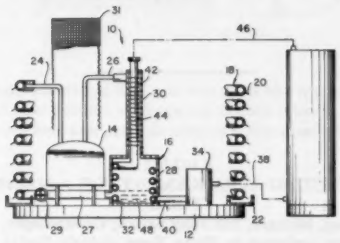
4,103,509

WATER HEATER-DEHUMIDIFIER COMBINATION HEAT PUMP

Edward W. Bottum, 9357 Spencer Rd., Brighton, Mich. 48116

Filed Feb. 28, 1977, Ser. No. 772,538
Int. Cl.[2] F25B *27/02, 39/02*
U.S. Cl. 62—238 6 Claims

1. A water heater-dehumidifier heat pump system including a compressor, condenser and evaporator operatively connected together, said evaporator including means for the circulation of air thereover in heat exchange relationship therewith for the purpose of dehumidifying the air, said evaporator being a vertically oriented helical tubular coil with the turns thereof spaced apart to permit flow of air by convection therearound, said coil being of relatively large diameter, said condenser and compressor being physically located within the evaporator coil, a drain structure provided beneath the evaporator to collect water condensate falling by gravity from the evaporator, a hot water tank including a water inlet and a water outlet,



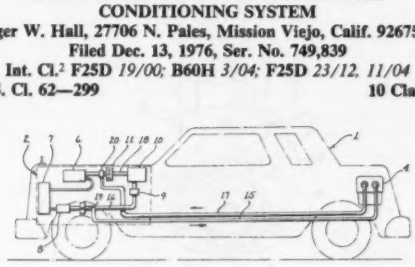
a heat exchange structure placed in heat exchange relationship with the condenser, said heat exchange structure including a water inlet, a water outlet and means for the flow of water therethrough, the water inlet of the heat exchange structure being connected to the water outlet of the hot water tank and the water outlet of the heat exchange structure being connected to the water inlet of the hot water tank for flow of water from the hot water tank through the heat exchange structure and thence back to the hot water tank for the purpose of heating the water.

4,103,510

PORTABLE COOLING CHEST OPERATIVELY ATTACHABLE TO AN AUTOMOBILE AIR CONDITIONING SYSTEM

Roger W. Hall, 27706 N. Pales, Mission Viejo, Calif. 92675

Filed Dec. 13, 1976, Ser. No. 749,839
Int. Cl.[2] F25D *19/00;* B60H *3/04;* F25D *23/12, 11/04*
U.S. Cl. 62—299 10 Claims



1. A portable cooling chest detachably attachable to an external source of refrigerant under pressure for chilling the contents disposed within said cooling chest, said cooling chest comprising in combination:

a. an outer shell;

b. a middle liner having side walls and a bottom and nested within said shell, said middle liner defining a compartment intermediate said shell and said middle liner;

c. insulation means disposed within the compartment for reducing the rate of heat transfer between said shell and said middle liner;

d. an inner liner having side walls and a bottom and nested within said middle liner for defining the storage capacity of said cooling chest, said inner liner developing a cavity intermediate said inner liner and said middle liner;

e. spacing and retaining means disposed within the cavity for restraining bulging and deformation of the side walls of said inner liner;

f. eutectic fluid disposed within the cavity;

g. a cooling coil disposed within the cavity for chilling said eutectic fluid; and

h. coupling means for coupling said cooling coil in fluid communication with the source of refrigerant;

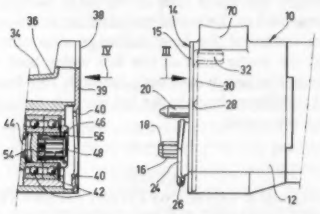
whereby, said chilled eutectic fluid absorbs heat from the contents of said cooling chest through the side walls of said inner liner and said insulation means reduces the transfer of heat from said shell to said eutectic fluid to maintain the contents chilled after detachment of said cooling coils from the source of refrigerant.

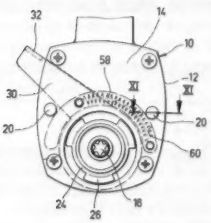
4,103,511

CONNECTING ARRANGEMENT FOR A MACHINE TOOL

Willy Kress, Bisingen, and Josef Seifert, Grosselfingen, both of Germany, assignors to Firma Kress elektrik GmbH & Co., Bisingen, Germany

Filed Oct. 4, 1976, Ser. No. 729,006
Int. Cl.² F16C *1/06, 1/12*
U.S. Cl. 64—4 **6 Claims**





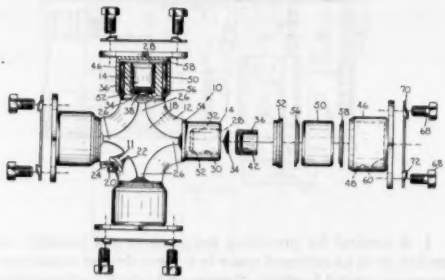
1. Connecting arrangement for a machine tool having an electromotor driving device in a housing and an exchangeable operating device comprising a driving shaft projecting from the housing of the driving device and a receiving coupling part in a housing of the operating device receiving the driving shaft, so that the housings of the driving device and operating device may be fixed together in a centered manner, wherein the housings of the driving device and operating device have flat, perfectly equal contact surfaces disposed perpendicularly in relation to the driving shaft, and wherein the housings are fixed mutually untwistably on their contact surface by means of axially outward protruding centering pins on one contact surface and centering openings on the other contact surface receiving the centering pins, further comprising coupling means operated from the outside of said contact surfaces when said contact surfaces are fitted against each other in a twist-secure manner.

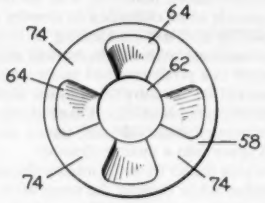
4,103,512

UNIVERSAL JOINT AND CROSS THEREFOR

John Christee McElwain, Rochester, and Lawrence Howard Hogan, Bloomfield Hills, both of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 686,038, May 13, 1976, Pat. No. 4,047,396.
This application Nov. 15, 1976, Ser. No. 741,600
Int. Cl.² F16D *3/30, 3/41*
U.S. Cl. 64—17 A **2 Claims**





1. A universal joint including a cross operably connected therein, said cross comprising a body having four trunnions extending therefrom along two mutually perpendicular lines, each of said trunnions having a cylindrical outer bearing surface thereon, needle bearings interposed oetween said outer cylindrical bearing surface on said trunnions and an inner cylindrical bearing surface within a bearing cup which covers and surrounds each of said outer bearing surfaces of said trunnions, a resilient thrust washer operably disposed between said bearing cup and said trunnions, said thrust washer having a series of channels defined by alternating offset portions formed thereon, said alternating offset portions extending radially from a central bore provided in said thrust washer and terminating at a point distant from the outer periphery of said washer to provide and define a continuous smooth annular bearing surface which transmits bearing loads between said bearing cup and said trunnions, said thrust washer in bearing engagement with a radially extending circumferential surface at the end of each of said trunnions and a radially extending inner surface at the end of said bearing cup, said thrust washer being a compliant member whereby it absorbs thrust transmitted through and between it from said cross to said bearing cup, said thrust washer additionally serving to maintain said needle bearings in alignment.

4,103,513

CONSTANT VELOCITY UNIVERSAL JOINT

Christian E. Grosser, 214 Sleepy Hollow Rd., Richmond, Va. 23229

Filed Apr. 6, 1977, Ser. No. 785,315
Int. Cl.² F16D *3/30*
U.S. Cl. 64—21 **29 Claims**

1. A constant velocity universal joint for rotatably transmitting power from one shaft to another without substantial varia-

tions in velocity at relatively large angles of deflection between shafts without substantial backlash comprising:

drive shaft coupling means for coupling the joint with a drive shaft;

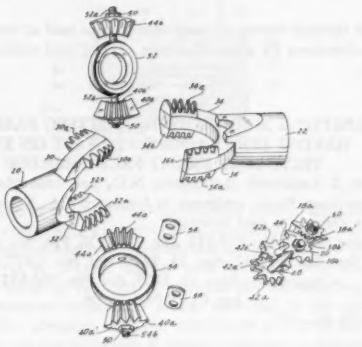
driven shaft coupling means for coupling the joint with a driven shaft;

a first pair of bifurcated forks extending from the drive shaft coupling means and including a first fork and a second fork each having spaced-free ends;

a second pair of bifurcated forks extending from the driven shaft coupling means and being interposed between and in space relationship with the first fork pair, the second fork pair including a third fork and a fourth fork each having spaced-free ends;

each fork having opposed side faces;

gear segment torque transmitting means interposed between



and coupling the opposed side faces of the adjacent forks while filling the space therebetween when the shafts are disposed at an angle relative to one another and the drive shaft is rotated and the driven shaft is rotated by the universal joint, the gear segment means including a gear segment on each side face at the fork-free end, the gear segment means including a pinion segment meshed with each gear segment; and

split interengagement means being provided for interengaging each pair of pinion segments between the first and fourth fork, fourth and second fork, second and third fork, and third and first fork whereby the pinion segments will rock back and forth relative to the associated meshed gear segment through the associated interengagement means when the shafts are disposed at an angle relative to one another and the drive shaft is rotated and the driven shaft is rotated by the universal joint.

4,103,514

TELESCOPING TORQUE TRANSMITTING SHAFT

Hubert Grosse-Entrup, Lohmar, Germany, assignor to Jean Walterscheid GmbH, Lohmar, Germany

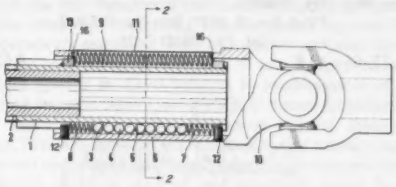
Filed Jul. 20, 1976, Ser. No. 707,106

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1975, 2532661

Int. Cl.[2] **F16D** *3/06*

U.S. Cl. 64—23.7 **6 Claims**

1. A telescoping torque transmitting shaft comprising a first shaft having an inner element and an outer element non-rotatably and slidably mounted thereon, said outer element having a plurality of axially extending circumferentially spaced grooves therein and on, a tubular second shaft co-axially positioned on said outer element and having a plurality of axially extending circumferentially spaced grooves corresponding in plurality to said outer element grooves to define pairs of opposed grooves, a plurality of roller elements linearly disposed in each said pair of opposed grooves, first spring means on said second shaft for limiting the axial movement of the roller elements in each pair of opposed grooves, and second spring means acting between both said second shaft and said outer element of the first shaft



for biasing said second shaft and said outer element to a predetermined axial position with respect to each other said second shaft is attached to a yoke member of a universal joint.

4,103,515

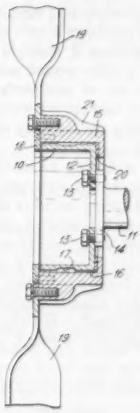
DRIVING MECHANISMS

Edward George Barrett, Witney, England, assignor to Smiths Industries Limited, London, England

Filed Aug. 6, 1975, Ser. No. 602,502

Int. Cl.[2] **F16D** *31/06, 31/08*

U.S. Cl. 64—26 **12 Claims**



1. A driving mechanism comprising,

a drive part,

a driven part rotatable about a common axis with said drive part with a shear-type fluid coupling therebetween,

said drive part and said driven part having respective opposing cylindrical surfaces which are spaced apart from, and substantially coaxial with, one another to define therebetween an annular space centered on said rotational axis of the parts,

said drive part and said driven part together with the fluid therebetween constituting the sole bearing for the driven part,

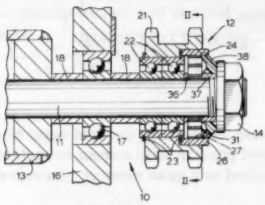
said cylindrical surfaces being formed at least in part by a member which is porous to the fluid comprising said shear-type fluid coupling, said member defining one of said opposing cylindrical surfaces, and means comprising only said porous member for storing said fluid.

4,103,516

LIMITED TORQUE DRIVE ROLLER

Richard Marcin, New Baltimore, Mich., assignor to Newcor, Inc., Bay City,, Mich.

Filed Apr. 8, 1977, Ser. No. 785,927
Int. Cl.[2] F16D *7/02*
U.S. Cl. 64—30 E **6 Claims**



1. In a torque-limiting drive mechanism, the combination comprising:

a first member supported for rotation about an axis, and a second member supported for rotation about said axis, said first and second members being supported for rotation relative to one another, and one of said members being adapted for driving connection with a power source;

said first and second members defining a pair of concentric opposed surfaces which are radially spaced apart and define a substantially annular recess therebetween, one of said surfaces being rotatable with one of the members, and the other of said surfaces being rotatable with the other of said members;

a non-circular resilient device interposed between said pair of surfaces for creating a torque-limiting driving path between said first and second members to cause the latter to synchronously rotate as a unit, said non-circular resilient device comprising a multiple coil spring member which is radially spirally wound and is solely in frictional engagement with one of said surfaces, the frictional engagement between said spring member and said one surface occurring solely through one or more small points of frictional contact;

the spring member including an inner annular hub portion which is fixedly anchored with respect to the inner one of said surfaces, said spring member also including an outer curved portion which is spaced radially outwardly from the hub portion and is frictionally engaged with said other surface at a plurality of angularly spaced points; and

said spring member further including an elongated resilient ramp portion which extends spirally outwardly from the hub portion and is joined to the outer curved portion, said ramp portion extending through at least one-half of a revolution.

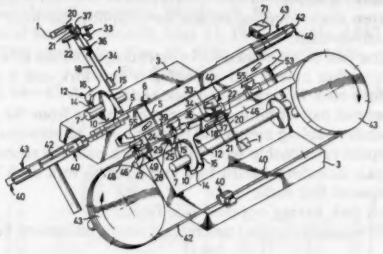
4,103,517

STRAIGHT KNITTING MACHINE

Manfred Schmid, Morikestr. 8, 7445 Bempflingen; Werner Sommer, Kolpingstr. 51, 7300 Esslingen, and Antonius Vinnemann, Am Bopserweg 11, 7000 Stuttgart 1, all of Fed. Rep. of Germany

Continuation of Ser. No. 705,286, Jul. 14, 1976, abandoned. This application Mar. 11, 1977, Ser. No. 776,909
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1975, 2531705
Int. Cl.[2] D04B *7/00, 15/66*
U.S. Cl. 66—75.1 **25 Claims**

1. A knitting machine comprising: at least one needle bed; at least one knitting tool which is movably mounted in said needle bed; at least one eccentric cam disc rotatably mounted in said needle bed, driving means for coupling said knitting tool with said cam disc for reciprocating said knitting tool in at least two opposite directions during knitting operations, said driving means permitting some play such that said knitting tool may be reciprocated in at least one of said directions by an additional distance; and adjustable means cooperating with said knitting tool for superimposing an additional movement on the movements thereof caused by said cam disc in said at least one of said directions by a preselectable part of said additional distance.

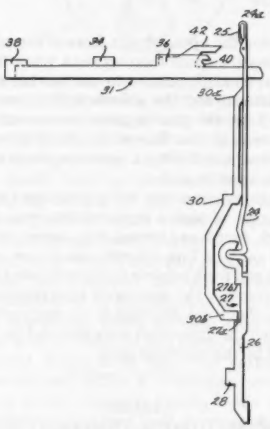


4,103,518

KNITTING MACHINE FOR KNITTING FABRICS HAVING TERRY LOOPS AT LEAST ON THE TECHNICAL FRONT FACE THEREOF

Victor J. Lombardi, Burlington, N.C., and José Ma Dalmau, Barcelona, Spain, assignors to Jumberca S.A., Spain, by José Ma Dalmau, a part interest

Division of Ser. No. 698,213, Jun. 21, 1976, Pat. No. 4,038,838, and Ser. No. 569,742, Apr. 21, 1975, Pat. No. 3,977,216. This application May 13, 1977, Ser. No. 796,822
Int. Cl.[2] D04B *15/06*
U.S. Cl. 66—107 **6 Claims**



1. Improved knitting apparatus for knitting terry loop fabric having terry loops knitted in on at least the technical front face of a base fabric, said apparatus comprising:

needle means for forming a knitted base fabric;

means for feeding ground and front loop yarns;

a plurality of sinker elements cooperating with said needle means for supporting the fabric at a level sufficiently high so that loops can be formed in the front face of said fabric, each of said sinker elements comprising an upper portion and a lower portion, said upper and lower portions being spaced apart thereby defining a sinker throat therebetween, said lower portion having top and leading edges said leading edge having a throat provided therein for receiving a yarn, said upper edge of said lower portion having a recessed portion therein defining the bottom of said sinker throat;

the upper portion of each of said sinker elements having top,

front and bottom edges, said front edge being sloped downwardly toward said throat, so that as the fabric web is contacted by said downwardly sloped leading edge, the fabric is forced down into the sinker throat; and

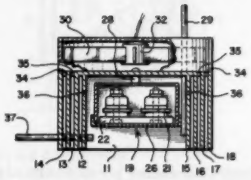
means for operating said needle means, and said plurality of sinker elements.

4,103,519

APPARATUS FOR ULTRASONIC CLEANING OF CARPET, UPHOLSTERY, AND SIMILAR MATERIALS

Amber Charles Davidson, Salt Lake City, Utah, assignor to Byron W. Boyd, Orem, Utah

Filed Mar. 18, 1977, Ser. No. 779,189
Int. Cl.[2] D06F *19/00*; B08B *3/12*
U.S. Cl. 68—3 SS **13 Claims**



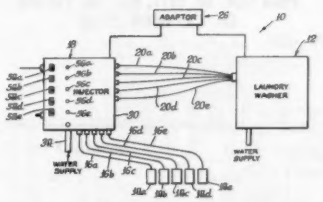
1. Apparatus for cleaning carpet, upholstery, and similar materials, comprising a cleaning head adapted to rest on and be moved over material to be cleaned and having a central chamber, open at its bottom, and at least one relatively narrow chamber, open at its bottom, peripherally surrounding the central chamber; transducer means mounted in the central chamber for vibrating cleaning solution at an ultrasonic frequency; means for supplying a cleaning solution to the central chamber in quantity sufficient to maintain a cleaning solution level in the chamber, when the cleaning head rests on the material to be cleaned, such that at least a portion of the transducer means is immersed in the cleaning solution, whereby vibration of the transducer means causes vibration of the solution; and means for controlling pressure in the central chamber above the cleaning solution thereby controlling pressure of the cleaning solution in the central chamber and for controlling pressure in the at least one relatively narrow peripheral chamber surrounding the central chamber, to substantially eliminate any flow of air into the solution in the central chamber and to prevent escape of substantial amounts of solution from the cleaning head.

4,103,520

ADAPTOR FOR AUTOMATED LAUNDRY SYSTEM

John R. Jarvis, Dallas, and Eldon W. Brown, Garland, both of Tex., assignors to Aid, Inc., Dallas, Tex.

Filed Mar. 11, 1977, Ser. No. 776,645
Int. Cl.[2] D06F *39/02*
U.S. Cl. 68—12 R **23 Claims**



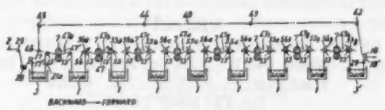
1. In a laundry system which includes a washer having means operative to effect a cycle of operation during which the washer undergoes a plurality of operating stages, said washer further having means for establishing a recurring impulse signal at predetermined time periods during said cycle of operation, said system including injector means adapted to inject a quantity of at least one laundry additive into said washer in response to a command signal, said injector means including timer means operative to receive said command signal and establish the time duration of each additive injection, the combination therewith comprising adaptor means separate from but operatively associated with said washer and said injector means for controlling the injection of said laundry additives into said washer in direct relation to establishment of said recurring impulse signals, said adaptor means including primary electrical power supply means separate from said washer, first means connected in circuit to said primary supply means and operable to establish a plurality of command signals in selected sequence, each of said command signals having operative association with said timer means in a manner to control injection of a selected laundry additive into said washer, said adaptor means including second means adapted to receive each impulse signal from said washer and being operative in response to receipt of each impulse signal to actuate said first means to establish a command signal so as to effect injection of a selected laundry additive into said washer.

4,103,521

APPARATUS FOR SUCCESSIVELY PROCESSING CONTINUOUS TEXTILE FABRIC

Yoshishige Tachibana, Akashi, Japan, assignor to Toyo Boseki Kabushiki Kaisha, Japan

Filed Apr. 6, 1976, Ser. No. 674,070
Claims priority, application Japan, Dec. 15, 1975, 50-149868
Int. Cl.[2] D06B *3/10*
U.S. Cl. 68—22 R **48 Claims**



1. An apparatus for successively processing a continuous textile fabric traveling along a predetermined feed path, said apparatus comprising:

means for feeding said continuous textile fabric along said path,

squeeze roll means having one end and another end defining an axial direction thereof, said squeeze roll means being disposed in said path for squeezing and nipping said continuous textile fabric at a plurality of nip points when said textile fabric is passed therethrough,

first and second guide roll means provided at respective sides of said squeeze roll means in parallel with and equally spaced apart from said squeeze roll means and having one end and another end defining an axial direction parallel to said axial direction of said squeeze roll means for guiding said continous textile fabric fed to and from said squeeze roll means,

said continuous textile fabric being successively and spirally set around said squeeze roll and said guide roll means from said one end to said other end thereof, respectively, said plurality of nip points of said continuous textile fabric as nipped by said squeeze roll means being grouped into pairs of adjacent nip points, each pair of said adjacent nip points defining a corresponding loop-like portion of said continuous textile fabric,

means provided along said feed path for processing said loop like portions of said continuous textile fabric,

first feed control means connected to said feeding means for enabling said feeding means to feed said continuous textile fabric in a first direction, and

second feed control means connected to said feeding means for enabling said feeding means to feed said continuous textile fabric in a second direction,

wherein said first and said second feed control means include respective means for setting said amount of travel in said first and second directions, respectively, and wherein the amount of travel of said continuous textile fabric along said feed path in said first direction of the feeding operation is set to be larger than that in said second direction of the feedingoperation, so that said continuous textile fabric is advanced in said first direction by a predetermined amount as a result of a predetermined number of said first and second directions of reciprocating feeding operations, said apparatus further comprising means operatively associated with said first and second feed control means for alternately enabling said first and said second feed control means, respectively, wherein said guide roll means is provided above the nip points of said continuous textile fabric nipped by said squeeze roll means, said squeeze roll means having a withdrawing side from which said textile fabric is withdrawn, and

the circumferential speed of said guide roll means at the withdrawing side of said squeeze roll means is adapted to be larger than the circumferential speed of said squeeze roll means.

4,103,522

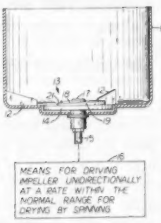
SPIRAL DASHER FOR WASHING MACHINES

George M. Gibson, 640 W. 249th St., Riverdale, N.Y. 10471

Filed Mar. 25, 1977, Ser. No. 781,501

Int. Cl.[2] D06F *17/10*

U.S. Cl. 68—133 2 Claims



1. A washing machine comprising:

a tub having a bottom and a substantially vertical wall for enclosing a space to contain wash,

a dasher within said space, said dasher having a generally circular base and a hub about the axis of said base, unidirectional driving means connected to said hub to rotate said dasher about said axis thereof,

a volute portion disposed on one side of said base, said volute portion being positioned within said space to permit freedom of movement of wash therein in any radial direction about said hub and in any direction incident to said one side of said base, said volute portion having a gradually curving smooth driving surface facing outwardly with respect to said hub, said driving surface having an inner end connected to said hub and extending spirally outwardly from said hub with gradually decreasing rate of curvature to an outer end of the driving surface terminating near the periphery of said base, and said ends of said driving surface having smooth and gradual contours.

4,103,523

APPARATUS FOR DYEING FLOCKED TEXTILE FIBERS

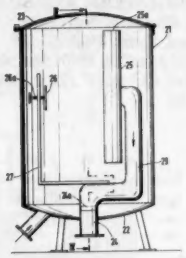
Ludwig Plack, Biedenkopf, Germany, assignor to Obermaier & Cie., Neustadt an der Weinstrasse, Germany

Filed Oct. 12, 1976, Ser. No. 731,784

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1975, 2546878

Int. Cl.[2] D06B *5/14*

U.S. Cl. 68—187 2 Claims



1. In an apparatus for dyeing pressed balls of flocked textile fibers of the type comprising a water-tight container having a liquid inlet opening, a liquid outlet opening and pump means connected to the inlet and outlet openings for circulating dye liquor through the container, and one wall of the container being hinged to provide a watertight door, the improved structure for the dyeing of the pressed balls of flocked textile fibers wherein said container has a cross-section of larger size than the size of the pressed balls to be dyed and comprises pressed ball positioning means consisting essentially of a collar-like spacing ring surrounding the outlet opening, a series of radial spacing ribs extending from the outlet opening towards said spacing ring whereby a pressed ball to-be-dyed can be placed over said outlet opening without blocking the latter, and means opposite said outlet opening for holding a pressed ball to-be-dyed on the spacing ring and radiating ribs, said inlet opening being positioned to supply dye liquor to the space surrounding the pressed ball, said outlet opening for the dye liquor being contained in a plate device containing the collar-like spacing ring which also comprises internal pipe means extending inside the container from the outlet opening towards one wall of the container, connecting pipe means for the internal pipe means extending through one wall of the container, said means opposite the outlet opening for holding a pressed ball on the spacing ring being connected to said plate device.

4,103,524

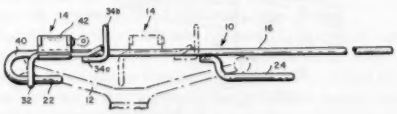
THEFTPROOF STEERING WHEEL LOCK

Ronald A. Mitchell, 87 Wesson Ave., Quincy, Mass. 02169, and William Augustus Bedford, Jr., Brockton, Mass., assignors to Ronald A. Mitchell, Quincy, Mass.

Filed Mar. 10, 1977, Ser. No. 775,950

Int. Cl.[2] B60R *25/02*

U.S. Cl. 70—209 10 Claims



1. An antitheft device for attachment to a steering wheel in an automobile comprising a rigid elongated bar of greater length than the diameter of the steering wheel, longitudinally spaced hooks on the bar for engagement with diametrically opposed segments of the steering wheel, one of said hooks being disposed to engage the rim from the outside and the

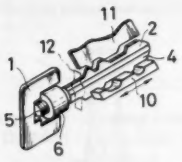
other from the inside, means mounted on the bar for movement thereon to a position to confine the rim within the one of said hooks and means for releasably locking said last-named means in confining position.

4,103,525

LEVER TUMBLER LOCK DEVICE HAVING VARIABLE WARD PATTERNS

Minoru Kamiya, 2-46-3, Minami-Otsuka, Toshima-ku, Tokyo, Japan

Filed Jun. 6, 1977, Ser. No. 803,532
Int. Cl.[2] E05B *19/18*
U.S. Cl. 70—347 **10 Claims**



1. A lock device comprising:

a key having a stationary bit member integral with the body of said key, a movable bit member slidably engageable with said stationary bit member for lengthwise displacement of said movable bit member relative to said stationary bit member and key fixing means for rigidly maintaining said movable bit member in selected position in respect to said stationary bit member;

a lock having a stationary ward member corresponding to said stationary bit member, a movable ward member corresponding to said movable bit member, and lengthwise displaceable in respect to said stationary ward member, said movable ward member being lengthwise displaceable by and simultaneously with said movable bit member to form various ward patterns, and lock fixing means for rigidly fixing said movable ward member in respect to said stationary ward member; and

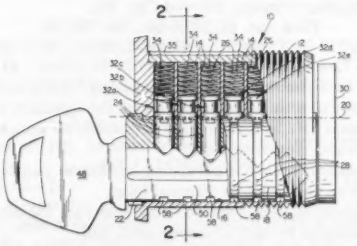
whereby after said key is inserted in a keyhole in said lock and turned to the lock-open position, then said movable bit member is lengthwise displaceable to a desired position relative to said fixed bit member, thereby resulting in said movable ward member being cooperatively displaced in response to the movement of said movable bit member.

4,103,526

PIN TUMBLER LOCK

Walter E. Surko, Jr., Southington, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Continuation of Ser. No. 555,404, Mar. 5, 1975, abandoned. This application Oct. 20, 1976, Ser. No. 734,199
Int. Cl.[2] E05B *15/14, 27/04*
U.S. Cl. 70—364 A **35 Claims**



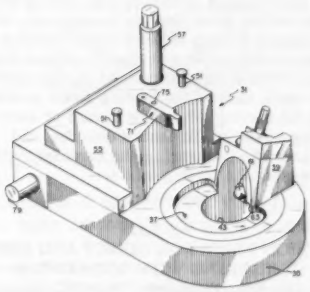
1. In a pin tumbler lock having a shell, a plug rotatable relative to said shell along a shear line between locked and unlocked positions, said shell and said plug having holes therein coaxially aligned in said locked position to define a plurality of bores, a plurality of axially elongated tumbler assemblies respectively received in said bores, each of said tumbler assemblies having at least one split line, means normally biasing each of said tumbler assemblies in an axial direction to a position relative to said shell and said plug wherein a split line thereof is out of alignment with said shear line to prevent rotation of said plug from its locked position, and means defining a keyway in said lock for receiving a proper key to move each of said tumbler assemblies axially in opposition to its biasing means and to a position wherein a split line thereof is generally aligned with said shear line to permit said plug to be rotated from its locked position to an unlocked position, the improvement comprising at least one of said tumbler assemblies supported in an associated one of said bores for angular movement about its axis within said one bore, said one tumbler assembly including a pin tumbler, a driver, and means releasably coupling said driver to said pin tumbler for angular movement of said driver about its axis in response to angular movement of said pin tumbler about its axis within said one bore, said coupling means at least partially defining an associated split line along which said pin tumbler and said driver may separate when said one tumbler assembly is axially and angularly positioned relative to said plug and said shell in a predetermined releasing position wherein said associated split line is aligned with said shear line, means on said pin tumbler for positioning said one pin tumbler assembly in said predetermined releasing position in response to insertion of a proper key into said keyway, and a groove in said plug receiving an associated portion of said coupling means therein for preventing angular movement of said driver about its axis when said driver and said pin tumbler are separated by rotation of said plug from its locked position to an unlocked position.

4,103,527

ROLL CRIMP MACHINE

John S. Eldridge, Sr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 20, 1977, Ser. No. 798,850
Int. Cl.[2] B21D *39/04, 17/04*
U.S. Cl. 72—75 **5 Claims**



1. An apparatus for joining two or more round members in an overlapping relation comprising:

a main body part;

an annular platform rotatably supported within said main body part, said platform being rotatable about a centerline axis and having a co-axial bore formed therethrough;

a ball bearing disposed within said annular platform and rotatable therewith about the centerline axis;

a window formed in the inner circumference of said annular platform; and,

means for automatically advancing said ball bearing through said window and into said bore as the annular platform is rotated relative to the main body part whereby as the

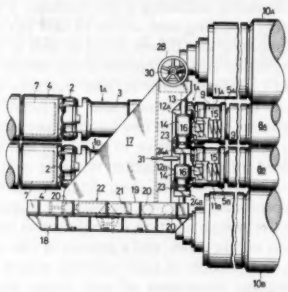
annular platform is rotated a circumferential groove is formed about said round members insertable in said bore to form a roll joint between the members.

4,103,528

APPARATUS FOR RELEASING DRIVE ASSEMBLY FROM DRIVEN SHAFT AND CONNECTING SAME THERETO

Hiroji Okuda, Kitakatsuragigun; Masaaki Washida, Muroran, and Hisashi Ide, Ikomagun, all of Japan, assignors to Koyo Seiko Company, Limited and Nippon Steel Corporation, both of Tokyo, Japan

Filed Jul. 28, 1977, Ser. No. 820,124
Int. Cl.[2] B21B *35/14*
U.S. Cl. 72—238 **16 Claims**



1. An apparatus for releasing a drive assembly from a driven shaft and connecting the same thereto, the drive assembly including a telescopic spindle and a sleeve-shaped coupling member connected to the spindle by a universal joint and releasable from and connectible to the driven shaft by the apparatus, comprising:

a frame supported on a base and slidable toward or away from the driven shaft in parallel to an extension of the axis of the driven shaft,

means for slidingly driving the frame,

a pair of holding means vertically slidably supportted by the frame and arranged on the opposite sides of the coupling member of the drive assembly respectively, the holding means having holders respectively for holding the opposite sides of the coupling member to support the coupling member in its horizontal position in alignment with the driven shaft, each of the holding means including drive means for moving the holder toward or away from the coupling means in a horizontal direction, and

control assemblies mounted on the frame for vertically slidingly moving the holding means.

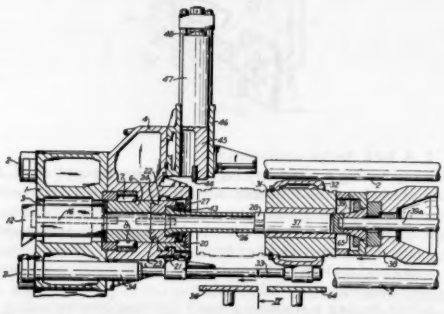
4,103,529

EXTRUSION PRESS FOR DIRECT AND INDIRECT EXTRUDING WITH DIE SHIFTER

Helmut B. Huertgen, Pittsburgh; Walter F. Larson, McKeesport, and Guenter W. Sibler, Pittsburgh, all of Pa., assignors to Sutton Engineering Company, Pittsburgh, Pa.

Filed Feb. 9, 1976, Ser. No. 656,518
Int. Cl.[2] B21C *23/08, 35/06*
U.S. Cl. 72—253 A **2 Claims**

1. In an extrusion press for both direct and indirect extrusion, a platen having a rear face and an extrusion-receiving horizontal passage extending through it from front to back, a gate lock housing mounted against said rear face and provided with a passage aligned with said platen passage, a billet container behind said housing passage and movable toward and away from it, ram means behind the container, means for moving the ram means and container toward and away from said housing, a tubular block member normally disposed in said housing passage, releasable gate lock means in said housing normally holding said block member in place, an indirect-extrusion bolster located behind said block member and having a passage therethrough aligned with the passage through the block member, an indirect-extrusion stem secured to the bolster and extending rearwardly from said housing toward said container, an extrusion die carried by the rear end of said stem, means secured to said block member for pulling it forward in said platen passage after release of said gate lock means, means connecting said bolster to said block member for forward movement therewith to draw said stem into an extrusion shearing position, said connecting means being formed to permit lateral movement of the bolster away from the block member when in their rear position, a direct-extrusion bolster, a direct-extrusion die mounted behind said direct-extrusion bolster and movable therewith, carrier means supporting said bolsters and



slidable horizontally, the carrier means being provided with an open end recess containing said indirect-extrusion bolster to permit said forward movement of that bolster out of said carrier means, and means for sliding the carrier means transversely of said aligned passages for moving said indirect-extrusion bolster and stem laterally away from said block member and out beyond the side of said housing when said container is in its rear position and for moving said direct-extrusion bolster laterally into the space behind said block member vacated by the indirect-extrusion bolster to locate the direct-extrusion die in operative position for direct extrusion, and said ram means including means for engaging the rear end of a billet in the container in the container's forward position to push the billet forward out of it and through said direct-extrusion die in said operative position.

4,103,530

SELF-CENTERING PUNCH FOR BILLET CENTERING MACHINE OR THE LIKE

James W. Schuetz, Pittsburgh, Pa., assignor to Aetna-Standard Engineering Company, Ellwood City, Pa.

Filed Apr. 18, 1977, Ser. No. 788,253
Int. Cl.[2] B21D *28/04*
U.S. Cl. 72—312 **11 Claims**

1. In an apparatus for center punching billets, as for the production of seamless tubing, wherein the apparatus includes

(a) means for clamping a billet in position for punching,

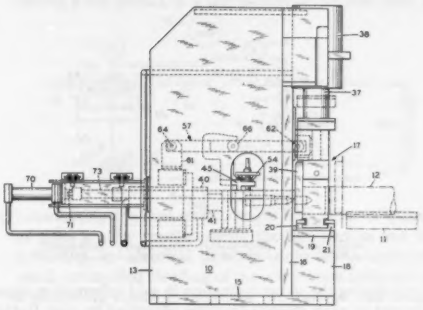
(b) a center punching tool,

(c) actuator means for advancing said center punching tool into an end face of a clamped billet,

(d) mounting means for securing said tool for advancing movement by said actuator means, and

(e) primary adjusting means for adjustably positioning said tool in alignment with the nominal axis of a billet of predetermined nominal diameter, the improvement characterized by

(f) compensating means mechanically coupled with said clamping means for adjustably positioning said tool inde-



pendently of said primary adjusting means, to compensate for variation of the billet from nominal diameter.

4,103,531

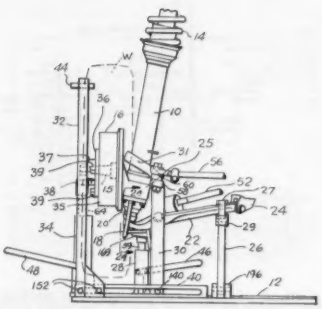
METHOD AND APPARATUS FOR CORRECTING BENT STRUT MISALIGNMENT

Danny O. Daniel, 230 N. 2nd, Pocatello, Id. 83201

Filed Aug. 18, 1976, Ser. No. 715,375

Int. Cl.[2] B21D *1/12*

U.S. Cl. 72—380 **42 Claims**



1. Apparatus, which comprises:

means for holding a strut of a vehicle having a wheel drum, a hub projecting through said drum, and a strut connected to said hub; and

bending means operatively connected to said wheel drum but not contacting said strut for bending said strut while installed in said vehicle.

4,103,532

DEVICE FOR MEASURING THE DAMPING EFFECT OF MOTOR VEHICLE SUSPENSIONS

Carlo Buzzi, Via Risorgimento 60, Mandello Del Lario (Como), Italy

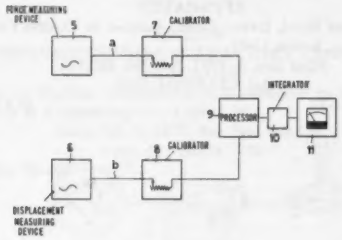
Filed May 11, 1977, Ser. No. 795,831

Claims priority, application Italy, Jun. 10, 1976, 7213 A/76

Int. Cl.[2] G01M *17/04*

U.S. Cl. 73—11 **11 Claims**

1. A device for measuring the damping effect of motor vehicle suspensions, comprising operating means for imparting a periodic vertical oscillating movement to a motor vehicle suspension, first sensor means for transducing the instantaneous force transmitted to the suspension into an electrical signal, second sensor means for transducing the instantaneous displacements of the point of application of said oscillating movement to the suspension into an electrical signal, first processing means for integrating over one cycle the scalar product of the signals emitted by the first and second sensor means to produce a first signal which is indicative of the amount of energy dissipated in one cycle, and second process-



ing means for dividing said first signal by a quantity proportional to the product of the oscillation frequency and the square of the oscillation amplitude to produce a second signal indicative of the value of the equivalent viscous damping coefficient of the suspension.

4,103,533

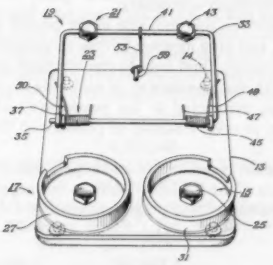
IMPACT GREASE TESTER

Curt Dinwiddie, Burbank, Calif., assignor to Lubrication Engineers, Inc., Fort Worth, Tex.

Filed Nov. 17, 1977, Ser. No. 852,197

Int. Cl.[2] G01N *3/34*

U.S. Cl. 73—12 **6 Claims**



1. Apparatus for testing grease comprising:

a. a base;

b. at least two anvil means carried by said base; each anvil means being adapted for receiving a grease sample thereon;

c. display means disposed adjacent the respective said anvil means and adapted to display for visual observation any grease that is splattered from said anvil means under a predetermined impact load;

d. bracket means carried by said base and adapted to deliver respective hammer means onto the respective anvil means and any grease thereon with equal impact forces;

e. at least two hammer means carried by said bracket means such that said hammer means are disposed one each to strike respective said anvil means and deliver an impact thereto and to any grease thereon; and

f. biasing means biasing said hammer means toward said anvil means with equal forces on each of said hammer means;

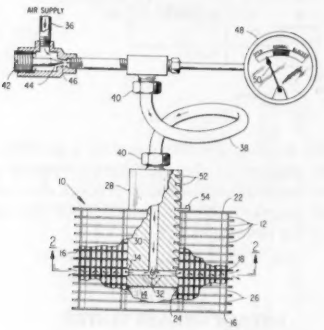
such that two greases can be emplaced on respective said anvil means and to be tested for tackiness and resistance to being displaced under shock loading by equal predetermined impact

forces delivered by said hammer means and the results graphically displayed on said display means.

4,103,534
HIGH ENERGY LOSS DISK STACK TESTING APPARATUS

Robert Grant Hoof, Irvine, Calif., assignor to Control Components, Inc., Irvine, Calif.

Filed Jun. 3, 1977, Ser. No. 803,171
Int. Cl.[2] G01M *3/02*
U.S. Cl. 73—37 **10 Claims**



1. A testing apparatus for

testing a disk stack having a central inlet and a peripheral outlet with labyrinth passageways formed in the stack between the inlet and the outlet at different heights of the disk stack to provide a predetermined resistance to fluid flow therethrough comprising:

a plug member sealably movable in the central inlet of said disk stack, said plug member having a passageway formed therein to supply fluid only to the labyrinth passageways aligned with the passageway of said plug member;

supply means connected to the passageway of said plug member to provide a supply of pressurized fluid thereto; and

indicating means connected to said supply means to indicate the pressure of the fluid flowing from said supply means to the passageway of said plug member.

4,103,535
METHOD AND APPARATUS FOR EXAMINING ROD-SHAPED ARTICLES

Walter F. Mutter, and Francis M. Watson, III, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 4, 1977, Ser. No. 821,756
Int. Cl.[2] G01B *13/02*
U.S. Cl. 73—37.5 **10 Claims**

1. A method for measuring and displaying characteristics of rod-shaped articles, comprising the steps of:

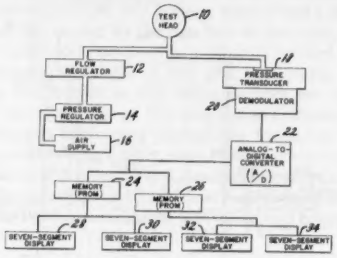
(a) providing signal-addressable storage locations in preselected number;

(b) storing separately in said storage locations information signals indicative of diverse values of article characteristics in number equal to said preselected number;

(c) disposing a rod-shaped article to be examined in a fluid-pressurized conduit;

(d) generating an output signal indicative of back pressure from said conduit during disposition of said article therein;

(e) converting said output signal into a further signal having address indication in predetermined relation to such back pressure indication in said output signal whereby such further signal identifies that storage location containing an information signal indicative of the article characteristic value of such examined article; and

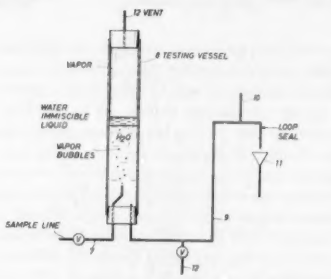


(f) displaying the value indication in said information signal stored in such storage location identified by said further signal.

4,103,536
METHOD FOR DETECTING LEAKS IN HEAT EXCHANGERS

Arthur H. Tigner Chipman, Long Beach, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 16, 1977, Ser. No. 768,934
Int. Cl.[2] G01M *3/04*
U.S. Cl. 73—40 **2 Claims**



1. The method of detecting leakage into cooling water of water-immiscible, liquid or gaseous process fluids which comprise at least one member of the group consisting of hydrocarbon liquids having a lower density than water and hydrocarbon vapors, from at least one piece of indirect heat exchange equipment wherein the process fluid is at a higher pressure than the cooling water, which comprises continuously withdrawing a sample stream of cooling water downstream from said heat exchange equipment from the upper portion of the conduit in which the cooling water is returned to the cooling means and passing the sample stream through a vertical transparent testing vessel which permits visual observation of its contents, wherein the liquid flow is slowed sufficiently to permit entrained process fluids to separate while a constant water level is maintained, and determining the presence and, if desired, the identity of said process fluids separated in said testing vessel.

4,103,537
MEANS AND METHOD OF HYDROSTATIC TESTING

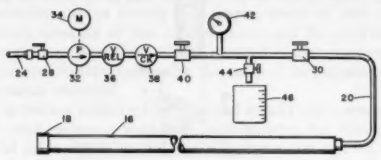
Floyd Ray Victor, San Diego, Calif., assignor to Rice Hydro Equipment Manufacturing, San Diego, Calif.

Filed Sep. 7, 1976, Ser. No. 720,902
Int. Cl.[2] G01M *3/28*
U.S. Cl. 73—40.5 R **9 Claims**

1. A method of quantitatively determining leakage in hydro-

static testing of pipe lines, comprising the following steps in the order named:

(a) first measuring the leakage in terms of pressure drop, during a test period, in a test section of the pipe lines; and



(b) converting the first measurement into terms of quantity of fluid loss by repressurizing the test section and then achieving an identical pressure drop by a reasonably quick, controlled bleeding of the test section collected into a measuring means to duplicate the leakage, and measuring the amount of bled-off fluid.

4,103,538

SURFACE HARDNESS TESTING APPARATUS

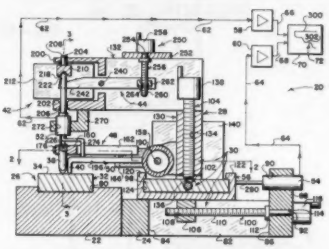
Theodor Stöferle, Weinbergstr. 29, D-6101 Seeheim and Paul Heinz Theimert, Gerhart-Hauptmann 10, D-6101 Weiterstadt, both of Germany

Filed Apr. 18, 1977, Ser. No. 788,661

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1976, 2617256

Int. Cl.[2] G01N *3/46*

U.S. Cl. 73—81 **15 Claims**



1. A surface hardness testing apparatus, comprising:

a. structure defining a test station adapted to receive and support a test member having a surface which is to be tested for hardness;

b. penetration member means for contacting and penetrating selected portions of the test surface;

c. sensor member means for gently engaging certain portions of the test surface at a location close beside the penetration member means;

d. penetration member support means for movably mounting the penetration member means for movement toward and away from the plane of the test surface;

e. sensor member support means for movably mounting the sensor member means for movement toward and away from the plane of the test surface;

f. force transmission means for applying a controlled loading to the penetration member means to effect its penetration of the test surface;

g. the penetration member support means and the sensor member support means being operable to permit concurrent lateral movement of the penetration member means and the support member means relative to the test member in directions paralleling the plane of the test surface while maintaining the penetration member means and the sensor member means in closely spaced relationship and without permitting the position and operation of the sensor member means to be influenced by the operation of the force transmission means; and,

h. transducer means for sensing relative positioning of the penetration member means and the sensor member means and for providing a corresponding representative output signal.

4,103,539

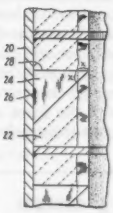
NON-DESTRUCTIVE REFRACTORY EROSION INDICATOR

Arthur C. Worley, Morristown, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Feb. 7, 1977, Ser. No. 766,129

Int. Cl.[2] G01N *3/56*

U.S. Cl. 73—86 **7 Claims**



1. A gage for monitoring erosion and/or wear in combination with equipment having an erodable refractory lining, comprising: an indicator plate member disposed within the lining of said equipment having a triangular configuration including at least one dimension which corresponds to the original thickness of said lining of said equipment, said dimension being in the direction of the thickness of said lining, said indicator member comprising a material different from that of said refractory lining such that it is non-destructive during operation of said equipment, such that as said lining is eroded and/or worn from its original thickness said indicator member is exposed relative to the remaining thickness at said lining, whereby said indicator member provides monitoring means for determination of the erosion and/or wear of said lining.

4,103,540

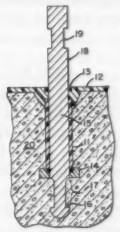
TESTING DEVICE FOR IN-SITE CEMENTITIOUS MATERIAL

Robert R. McLaughlin, J1. Baranangsiang, Bogor, Indonesia

Filed Sep. 23, 1977, Ser. No. 835,997

Int. Cl.[2] G01N *3/00*

U.S. Cl. 73—88 C **7 Claims**



1. A device for testing the strength of cementitious material at some depth below the surface comprising in combination:

(a) a test rod of generally cylindrical shape,

(b) a reaction piece of generally cylindrical shape and having a hollow bore,

(c) said test rod having a central portion adapted for sliding engagement within said bore,

(d) said hollow bore having a length less than said test rod whereby each end of said rod protrudes from said bore,

(e) said test rod having a first end comprising a head portion with means to which an external axial force may be applied,

(f) said test rod having a second end comprising a foot portion,

(g) said test rod having a generally cylindrical portion extending from the central portion to the foot portion and occupying a region of cementitious material comprising the test grip,

(h) said test grip portion of said test rod having an inner diameter less than the diameter of said foot,

(i) said foot having a generally flat surface in a plane normal to the axis of the test rod adjoining the test grip portion,

(j) said reaction piece having a section with an outer diameter greater than said foot and a generally flat surface facing said foot, and terminating at an inner diameter adjoining said test rod

whereby said device may be cast into the cementitious material at some depth with said foot and said reaction piece spaced apart the distance comprising said test grip and an axial force may be applied to determine the strength of said cementitious material as a function of the force required to rupture the cementitious material in the test grip between said foot and said reaction piece.

4,103,541

METHOD OF AND A DEVICE FOR MEASURING A RELAXATION PHENOMENON

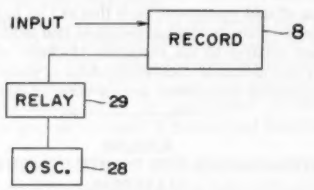
Kozo Arai; Teizo Kotani, both of Yokohama, and Toshio Mizushima, Tokyo, all of Japan, assignors to Japan Synthetic Rubber Company Limited, Tokyo, Japan

Filed Nov. 3, 1977, Ser. No. 848,160

Claims priority, application Japan, Jan. 12, 1977, 52-1431

Int. Cl.[2] G01D *9/16;* G01N *3/06*

U.S. Cl. 73—88 R **3 Claims**



1. A method of measurement of relaxation phenomena, whereby pulse signals are generated at equal intervals for logarithmic values of time by means of a logarithmic time pulse oscillator, and input signals representing a relaxation phenomenon are recorded every time said pulse signal is delivered.

4,103,542

METROLOGY INSTRUMENT FOR MEASURING VERTICAL PROFILES OF INTEGRATED CIRCUITS

William R. Wheeler, Saratoga; George J. Kren, Los Altos, and Karel Urbanek, Atherton, all of Calif., assignors to Tencor Instruments, Mountain View, Calif.

Filed Sep. 9, 1977, Ser. No. 831,870

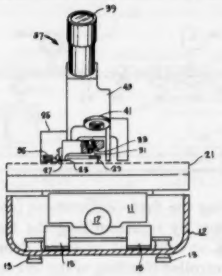
Int. Cl.[2] G01B *5/28*

U.S. Cl. 73—105 **24 Claims**

1. A tilt compensated stylus scanner assembly comprising,

a balanced scanner arm mounted for rotation about a vertical axis, said scanner arm having a stylus mounted proximate to a first end of said scanner arm for contact with a flat article to be scanned, said scanner arm having scanning motion means connected to said scanner arm for providing motion to said scanner arm,

gimbal mount means having aligned pivots defining a horizontal axis and aligned pivots defining said vertical axis perpendicularly intersecting said horizontal axis for mounting said balanced scanner arm, said gimbal mount means itself mounted for rotation relation to a fixed base about said horizontal axis, and



force means connected to said base and communicating force to said gimbal mount means for compensating undesired tilt of said vertical axis with respect to said horizontal axis.

4,103,543

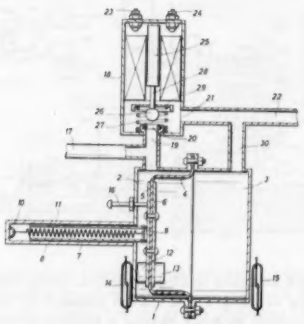
METHOD AND APPARATUS FOR DETERMINING VEHICLE FUEL CONSUMPTION

John W. Bertetti, 2215 San Jacinto, Pasadena, Tex. 77502

Filed Sep. 29, 1976, Ser. No. 727,417

Int. Cl.[2] G01L *3/26*

U.S. Cl. 73—114 **5 Claims**



1. Apparatus for indicating the ratio of fuel consumption to distance travelled in a vehicle having a motor, a fuel supply and a fuel line extending between said motor and said supply, comprising

container means having an internal fuel-filled chamber and first and second ports interconnecting said chamber with said fuel line,

a movable wall member disposed in said container means for dividing said chamber into a first compartment interconnected with said first port for receiving fuel from said fuel line and a second separate compartment interconnected with said second port for supporting and discharging a preselected quantity of fuel into said fuel line,

valve means interconnected with said fuel line and normally positioned to permit fuel flow to by-pass said container means and alternatively positionable to divert fuel flow from said supply to said first port and into said first compartment in said container means to displace said preselected quantity of fuel from said second compartment therein through said second port and said fuel line to said motor,

metering means for generating discrete impulses function-

ally related to predetermined increments of distance travelled by said vehicle during said displacement of said preselected quantity of fuel,

counting means responsive to said metering means for counting the number of said discrete impulses generated by said metering means during said displacement of said preselected quantity of fuel to said motor and for providing a visible representation of said number of discrete impulses counted thereby indicating the ratio of fuel consumed to distance traveled,

first actuating means interconnected to said valve means and to said metering means and energizable for positioning said valve means to said alternative position to divert said fuel flow from said supply to said first port and instituting generation of said discrete impulses simultaneously therewith,

second actuating means interconnected to said first actuating means and responsive to manual initiation for energizing said first actuating means, and

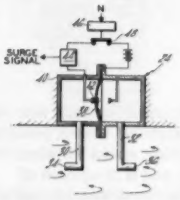
means interconnected with said movable wall and responsive to said displacement of said preselected quantity of fuel for deactuating said first actuating means for interrupting generation of said discrete impulses and for repositioning said valve means to said position for allowing said fuel flow to normally by-pass said chamber means simultaneously therewith.

4,103,544

TURBINE ENGINE SURGE DETECTOR

Peter V. Beckmann, Lake Park, and James B. Kelly, Lake Worth, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 18, 1977, Ser. No. 825,871
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—115 **7 Claims**



1. Apparatus for detecting incipient surge in a gas turbine type power plant having an axial flow compressor comprising a pair of back-to-back disposed pitot tubes extending in the working medium of the gas turbine power plant, each of said pitot tubes oriented so that each of its openings is disposed substantially parallel to the flow of the working medium, means for sensing the pressure differential created by said pair of pitot tubes and means responsive to a predetermined threshold value of said pressure differential below which a signal is produced indicative of an incipient surge in said compressor.

4,103,545

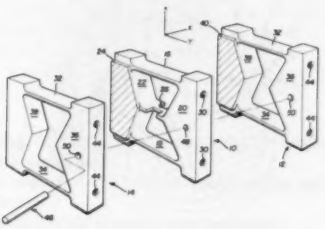
LOAD CELL

Stanley J. Rykwalder, Farmington, and Frederick J. Zink, Redford, both of Mich., assignors to Lebow Associates, Inc., Troy, Mich.

Filed Sep. 9, 1977, Ser. No. 832,044
Int. Cl.[2] G01L *1/26*
U.S. Cl. 73—141 A **3 Claims**

1. A device for measuring forces along and parallel to a first axis comprising:

a sensing structure comprising a first pair of spaced parallel beams oriented with their longitudinal axes perpendicular to the first axis and coplanar therewith; a first pair of end structures extending parallel to the first axis and interconnecting the ends of said first pair of beams; said first pair of beams and their connections with said end structures being configured to be resiliently yieldable to a relatively large degree to forces applied parallel to the first axis but substantially unyieldable to forces applied along a third axis mutually perpendicular to the first axis and to said longitudinal axes, said first pair of beams and said end structures forming a generally rectangular substantially open-centered structure which yields as a parallelogram in response to applied forces to be measured, said first pair of beams preventing relative rotation between said end structures, said pair of end structures being essentially rigid and unyieldable within the range of forces to be measured; and a sensing member located parallel to and midway between said first pair of beams and rigidly connected at its ends to the mid-points of said end structures, said sensing member being constructed and proportioned to be resiliently yieldable to forces to be measured, but less yieldable thereto than are said first pair of beams, and substantially unyieldable to forces applied along said third axis, one of said end structures adapted to have the force to be measured applied thereto as the force input element and the other of said end structures adapted to be the force output element of said sensing structure;



a pair of outer structures located on opposite sides of said sensing structure and spaced therefrom in a direction parallel to said third axis, each of said outer structures comprising a pair of spaced parallel flexural beams parallel to said first pair of beams, and a pair of end structures parallel to said first pair of end structures and interconnecting the ends of said flexural beams of said outer structures so that each of said outer structures is in the form of a generally rectangular open-centered structure which yields as a parallelogram in response to applied forces to be measured, said flexural beams preventing relative rotation between the end structures which they interconnect;

said force output element of said sensing structure being rigidly joined to the corresponding end structure of each of said outer structures, but said sensing and outer structures being otherwise normally unconnected to each other, the other end structure of each of said outer structures being rigidly connected to a fixed reaction structure;

whereby the bending of said sensing member in response to a force to be measured applied parallel to the first axis is proportional to such force.

4,103,546

TENNIS RACQUET STRING TENSION GAUGE

Robert Hickey, 1725 N. 16th Ave., Hollywood, Fla. 33020, and Erik Fahnoe, 655 Jeffrey St. #103, Boca Raton, Fla. 33432

Filed Sep. 22, 1976, Ser. No. 725,666
Int. Cl.[2] G01L *5/06*
U.S. Cl. 73—145 **5 Claims**

1. A guage for measuring the tension in the strings of a tennis racquet head comprising:

a rigid frame including

an upper arm having opposite end portions and an intermediate portion;

end portions lying in the same plane surface and said

intermediate portion being spaced from a planar surface parallel to the planar surface of said end portions

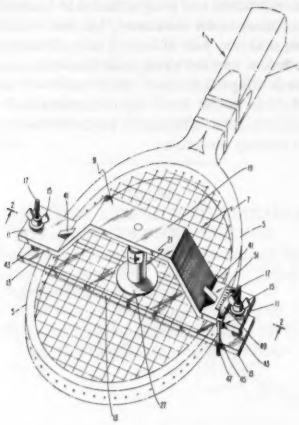
a lower arm;

attachment means including means disposed on the opposite ends of the frame for clamping said upper and lower arms about the head of a tennis racquet for releasably securing said frame across said head;

a first spring housing on said frame projecting toward a racquet face;

a second housing telescopically received in said first housing and including a pressure plate in position for engaging a plurality of strings of the racquet face;

a spring disposed inside said first and second housings for biasing said housings axially apart from each other;



means on said housing for indicating the force exerted by said tennis racquet strings on said spring by means of said pressure plate and thereby providing an indication of the tension in the strings of the racquet; and,

means for correcting the calibration of the gauge to account for head frames of different thicknesses comprising:

a thickness guide supported from one end of said upper arm projecting toward said lower arm and including a scale on the end thereof aligned with an edge of said lower arm; and,

said lower arm edge being cooperative with said scale to provide a correction factor whereby the string tension may be accurately measured for tennis racquets having head frames of different thicknesses.

4,103,547

LOCOMOTIVE TRACK CURVATURE INDICATOR

Joseph D. Vrabel, Concord, Mass., assignor to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.

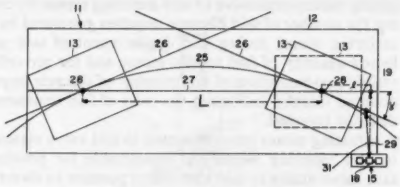
Filed Feb. 7, 1977, Ser. No. 765,876
Int. Cl.[2] G01M *17/02*
U.S. Cl. 73—146 **8 Claims**

1. Apparatus for dynamically determining track curvature and comprising:

a railroad car comprising a car frame pivotally supported on track means;

a sensor means for mounting on said railroad car frame, said sensor means producing a variable output responsive to rotational movement in the horizontal plane between said railroad car frame and said track means;

control circuit means for converting said output into an electrical signal representative of the track curvature causing said rotational movement; and



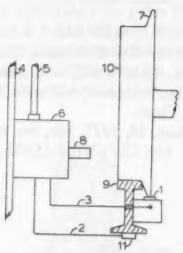
indicator means receiving said signal and providing dynamic and static indications of track curvature in response thereto.

4,103,548

WHEEL-WEAR MONITOR

Frank W. McDonald, 4420 Choctaw Circle, SE., Huntsville, Ala. 35801

Filed Mar. 7, 1977, Ser. No. 774,918
Int. Cl.[2] G01M *17/00*
U.S. Cl. 73—146 **2 Claims**



1. Apparatus mounted at track side which detects overlength flanges of freight car wheels, predicts wheel position for the purpose of marking, marks the wheel with a pneumatically driven paint pellet, and is comprised of:

a. Multiple rail-mounted contacts, one set for each direction of train travel, so positioned with respect to the rail surface that flanges of worn wheels momentarily actuate the switches, sending pulses to pulse detectors;

b. pulse detectors which receive the input pulses from the rail-mounted contacts and generate a timing marker which passes through the logic unit and actuates counters;

c. a logic unit which is selective between two sets of rail-mounted contacts, as required for direction of travel of the train and which utilize the output of counters in conjunction with constants derived from the installation configuration to compute and transmit to the comparator, timing values required to produce timed signals that discharge an air pellet gun, operate the shuttle in the air pellet gun for the purpose of reloading the gun, operate the reload accessories which reload the gun, cut off counter (14C), and reset all counters to zero in readiness for detection of the next overlength flange;

d. a comparator which (1) compares the outputs of counters (14A and 14B) for equality and monitors the output of an underrail load cell to prevent tampering and (2) compares the output of a free-running counter, (14C) with timing values from the logic unit and on coincidence (3) generates signals which operate pneumatic valves and apply and remove compressed air to and from the air gun discharge chamber, drive the shuttle in the air pellet gun to reload the gun, drive reload rams to reload the shuttle,

stop counter (14C), and resets the counters to zero in preparation for the next overlength flange;

e. counters which are activated and deactivated by signals from pulse detectors (14C deactivated by comparator generated signal) and which count cycles of a time base oscillator that are transmitted to the comparator and, in the case of counters 14A and 14B, to the logic unit;

f. reload accessories consisting of refillable springloaded clips with paint pellets and electrically controlled pneumatic pistons which punch paint pellets from the clips into bores in the shuttle in the air pellet gun;

g. an oscillator which provides the signal to the counters and provides the time base for predicting an intercept of a paint pellet and a wheel in motion and a means for synchronizing the apparatus operations;

h. a load cell which the comparator monitors to assure the presence of a train on the track, and

i. an air-pellet gun which is discharged by an electrically controlled pneumatic valve, on signal from the comparator, and which drives a marking paint pellet into the face of a wheel.

4,103,549

TIRE VALVE CAP WITH PRESSURE INDICATOR

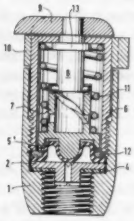
Helmut Schmidt, Keplerstrasse 51, 7530 Pforzheim, Fed. Rep. of Germany

Filed Jun. 20, 1977, Ser. No. 808,180

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627529

Int. Cl.[2] B60C *23/04*

U.S. Cl. 73—146.8 **10 Claims**



1. A pressure indicating valve cap assembly which is adapted for attachment to a conventional automotive tire valve, the assembly comprising in combination:

an elongated closed housing structure with a female connecting thread in one end portion by which it can be threaded onto the end of a tire valve stem in the manner of a conventional tire valve cap, the housing structure having an axial bore and including means for opening the tire valve so as to connect an axial end portion of said bore with the tire pressure;

piston means arranged inside the housing structure and guided for movement along its axial bore, the piston means being exposed to the tire pressure and biased against said pressure by a spring, so that a change in tire pressure reflects itself in a corresponding axial displacement of the piston means;

rotary pointer means journalled inside the housing structure, in a generally coaxial relationship with its axial bore, the pointer means including a pointer member with a pointer protrusion which is located on the outside of the housing structure;

a stationary pointer protrusion arranged on the housing structure, in the vicinity of the path of said pointer member protrusion, so that the relative angular positions of the two pointer protrusions are ascertainable visually and by finger touch; and

means for converting the axial displacements of the piston means into rotary displacements of the pointer means.

4,103,550

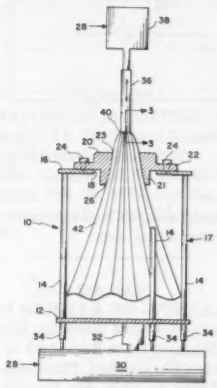
NOZZLE EXTRACTION PROCESS AND HANDLEMETER FOR MEASURING HANDLE

Vernon L. Alley, Jr., Newport News, and Austin D. McHatton, Hampton, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 19, 1976, Ser. No. 733,825

Int. Cl.[2] G01L *5/04*

U.S. Cl. 73—159 **30 Claims**



1. A system for quantitatively measuring the handle of flexible materials comprising:

a nozzle composed of a truncated cone section and an annulus section;

a sample of flexible material to be measured;

means for holding said nozzle;

means for drawing said flexible material sample through the truncated cone and annulus sections of said nozzle;

means for determining a force necessary to draw said flexible material sample through said nozzle; and

means for determining a displacement of said flexible material sample with respect to said nozzle in order to determine a compaction ratio of said flexible material sample in said nozzle.

4,103,551

ULTRASONIC MEASURING SYSTEM FOR DIFFERING FLOW CONDITIONS

Lawrence C. Lynnworth, Waltham, Mass., assignor to Panametrics, Inc., Waltham, Mass.

Filed Jan. 31, 1977, Ser. No. 763,939

Int. Cl.[2] G01F *1/66*

U.S. Cl. 73—194 A **23 Claims**

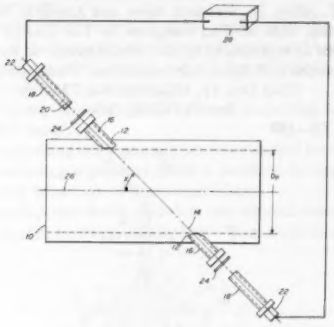
22. The method of measuring ultrasonic response characteristics of a fluid medium flowing within a duct having a circular internal cross section comprising the steps of

transmitting a beam of ultrasonic energy into said flowing material from a first position on the duct wall located on a midradius chord of said circular cross section,

directing said beam along the entire length of said midradius chord,

measuring at a second position ultrasonic energy transmitted through said fluid medium;

said beam following a path from said first position to said second position that includes said midradius chord; and



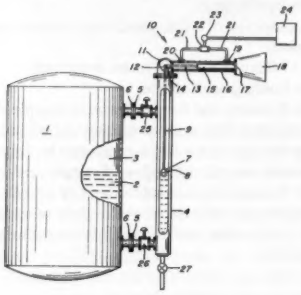
directing said beam along at least one other midradius chord prior to said measuring step.

4,103,552

IN-SERVICE CLEANING OF A LIQUID LEVEL SENSOR

Bernard A. Bucchianeri, Carrol Township, Washington County, and Robert A. Senchur, Plum Boro, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed May 24, 1976, Ser. No. 689,609
Int. Cl.[2] B08B *3/02*; G01F *23/10*
U.S. Cl. 73—309 **1 Claim**



1. In a combination which includes a vessel for containing liquid and a liquid level sensor connected to said vessel, said sensor comprising:

means forming a chamber communicating with said vessel to receive liquid therefrom;

a displacer within said chamber movable up and down with changes in the level of liquid in said vessel;

a tubular housing located at the top of said chamber and communicating therewith;

rotary means within said housing and connected with said displacer; and

a controller carried by said housing and operatively connected with said rotary means;

the improvement comprising:

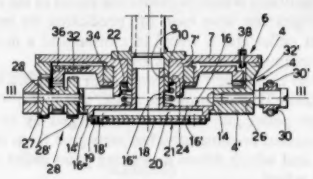
two tubular fittings connected to said housing adjacent opposite ends thereof; and a source of cleaning liquid externally located with respect to said housing, said source serving to provide liquid under sufficient pressure for introduction into said housing; said tubular fittings each serving to increase the flow of cleaning liquid so as to inject a stream of cleaning liquid into the housing for flushing solid particles from said housing and from the rotary means within said housing; and means for selectively conducting cleaning liquid out of the housing.

4,103,553

APPARATUS FOR THE INDIRECT MONITORING OF THE RADIOACTIVE CONTAMINATION OF SURFACES

Mario De Blasiis; Antonio Moccaldi; Attilio Rori, and Silvano Tagliati, all of Rome, Italy, assignors to Comitato Nazionale per l'Energia Nucleare-CNEN, Rome, Italy

Filed Jul. 27, 1976, Ser. No. 709,185
Claims priority, application Italy, Sep. 4, 1975, 51197 A/75
Int. Cl.[2] G01N *1/04*
U.S. Cl. 73—425 **9 Claims**



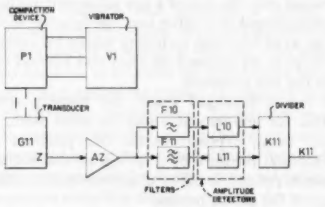
1. An apparatus for the indirect monitoring of the radioactive comtamination of surfaces by smearing a predetermined area thereof by means of a thin disk of filter paper or similar material which apparatus comprises a hollow cylindrical member with parallel end walls and a peripheral wall which walls define a space within said member, one of said parallel walls being provided with an array of through bores; a pierced layer of elastic material over said pierced wall which layer is provided with a similar array of through holes as said pierced wall the holes of the latter and of the elastic layer being made to coincide, said thin disk of filter paper being applied over the exposed face of said elastic layer; a cylindrical guide attached to a wheeled frame in which guide said cylindrical member is slidably fitted, a helical spring being provided for biasing said member towards said surface, the space within said cylindrical member being connected to an exhausting means.

4,103,554

METHOD AND A DEVICE FOR ASCERTAINING THE DEGREE OF COMPACTION OF A BED OF MATERIAL WITH A VIBRATORY COMPACTING DEVICE

Heinz Friedrich Thurner, Bunsövägen 29, Slatsjö-Boo, Sweden (13200)

Filed Mar. 2, 1977, Ser. No. 773,783
Claims priority, application Sweden, Mar. 12, 1976, 7603249; Aug. 3, 1976, 7608709
Int. Cl.[2] G01M *7/00*; E02D *3/06*
U.S. Cl. 73—573 **9 Claims**



1. A method for measuring the degree of compaction achieved in a bed of material by a vibratory compaction device comprising the steps of:

vibrating the compaction device against the bed of material to be compacted to generate a characteristic signal of the vibratory motion of the compacting device against said material, said characteristic vibratory motion signal having a fundamental frequency and a plurality of harmonic frequencies;

measuring the amplitude of said characteristic vibratory motion signal at said fundamental frequency;

measuring the amplitude of said characteristic vibratory motion signal for at least the second harmonic of said fundamental frequency; and

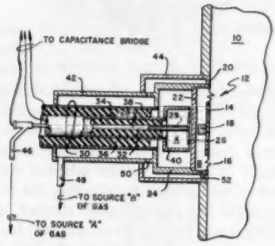
comparing the measured amplitudes of said fundamental frequency and said at least second harmonic frequency to ascertain the degree of compaction of said bed of material.

4,103,555

PRESSURE SENSOR FOR HIGH-TEMPERATURE LIQUIDS

George A. Forster, Westmont, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 6, 1977, Ser. No. 804,123
Int. Cl.[2] G01L *7/08, 9/12*
U.S. Cl. 73—706 **4 Claims**



1. A sensor of pressure in a fluid comprising:

a soft diaphragm exposed on a first side to the fluid and on a second side to a first source of gas at a first gas pressure;

a stiff diaphragm exposed on a first side to the first source of gas and on a second side to a second source of gas at a second gas pressure, the stiff diaphragm disposed in pushing engagement with the soft diaphragm such that motion of the soft diaphragm is transmitted to the stiff diaphragm when and only when the pressure in the fluid exceeds the first and second gas pressures; and

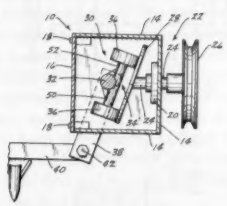
means for measuring displacement of the stiff diaphragm, which displacement is a function of the pressure in the fluid.

4,103,556

MECHANICAL MOVEMENT MECHANISM

Louis L. Niday, 2816-42nd, Des Moines, Iowa 50310, assignor to Louis L. Niday, Des Moines, Iowa

Filed May 12, 1976, Ser. No. 685,656
Int. Cl.[2] F16H *21/16*
U.S. Cl. 74—25 **12 Claims**



1. A mechanical movement assembly comprising:

a frame means;

rotatable means rotatably attached to said frame means and having a contact face disposed at an oblique angle to the axis of rotation of said rotatable means;

an oscillatory shaft rotatably attached to said frame means;

bearing means attached to said oscillatory shaft and oscillated thereby and in contact with said contact face;

said bearing means including a first bearing arm attached to said oscillatory shaft and spaced in one direction from the longitudinal axis of the oscillatory shaft and a second bearing arm attached to said oscillatory shaft and spaced in an opposite direction from said first bearing arm; and

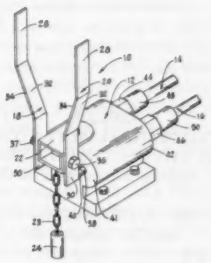
said first bearing arm being offset parallel with respect to said second bearing arm and disposed such that the midpoint between the axes of the first and second bearing arms is intersected by the axis of rotation of said rotatable means.

4,103,557

TOOL APPARATUS FOR MOUNTING ON A HOUSING

Richard E. Guthrie, 524 S. 7th St., and Ronald L. Allenbach, 516 S. 8th St., both of Kiowa, Kans. 67070

Continuation of Ser. No. 628,583, Nov. 4, 1975, abandoned. This application Feb. 10, 1977, Ser. No. 767,360
Int. Cl.[2] F16H *21/44*
U.S. Cl. 74—102 **4 Claims**



1. A tool apparatus for urging a pair of slidably mounted plungers inwardly into a housing, the apparatus comprising:

a hollow angular shaped lever mount having a top portion, a bottom portion, side portions, and a hollow center portion, said lever mount having an outwardly extending flange portion integrally formed in the top portion of said lever mount, the flange portion having an aperture therein for receiving a bolt therethrough and securing the lever mount to the housing; and

a pair of levers having a first end, a second end, sides, and an edge therearound, a portion of the sides of said levers disposed against the side portions of said lever mount, the sides of said levers and the side portions of said lever mounts having apertures in said levers indexed with the apertures in the side portions of said lever mount for receiving a bolt therethrough and rotatably mounting said levers to said lever mount.

4,103,558

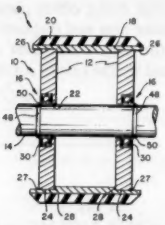
BOGIE WHEEL

Edwin A. Peabody, deceased, late of Grosse Pointe Woods, Mich., and by Gertrude A. Peabody, administratrix, 1010 Rowlyn Rd., Grosse Pointe Woods, Mich. 48236

Filed Sep. 13, 1976, Ser. No. 722,484
Int. Cl.[2] F16H *55/48;* B62D *55/14*
U.S. Cl. 74—230.7 **2 Claims**

1. A bogie wheel comprising a shaft, a wheel body composed of a pair of laterally spaced radially extending annular flanges, a rim extending about the radially outer peripheries of said flanges, sealed bearings mounting said flanges on said shaft, the axially outer surfaces of said flanges at the radially

inner edges thereof having recesses in which said bearings are disposed, and removable retainers on said shaft on opposite



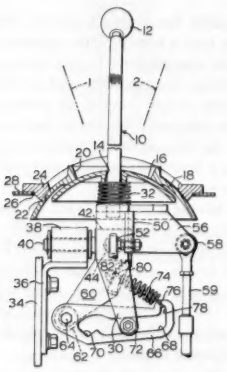
sides of said wheel body and engageable with said bearings to retain said wheel body on said shaft.

4,103,559

DETENTED MANUAL ACTUATOR FOR A MULTIFUNCTION SYSTEM

Ramon C. Kohler, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 9, 1977, Ser. No. 776,075
Int. Cl.[2] G05G *9/00*
U.S. Cl. 74—471 XY **8 Claims**



4. A manual actuator for a multifunction system, comprising:

a lever including a manually grippable handle and a projection on said lever;

a first mounting element mounting said lever for movement along a first axis between first and second positions;

a second mounting element mounting said first mounting element, and thus said lever, for movement along a second axis intersecting said first axis so that said lever is movable between third and fourth positions; and

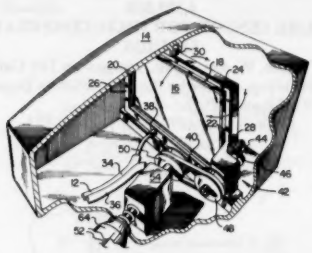
a detent mechanism carried by said first mounting element, and movable therewith along said second axis for holding said lever in at least one of said first and second positions, said detent mechanism including a detent element having a recess opening towards said projection movably mounted on said first mounting element, and means urging said detent element toward said projection.

4,103,560

DAY-NIGHT MIRROR CONTROL APPARATUS

Robert W. Stoffel, 1890 Le Tarte, and Robert A. Berntsen, 4295 Armstrong Rd., both of Muskegon, Mich. 49441

Filed Mar. 17, 1977, Ser. No. 778,701
Int. Cl.[2] F16C *1/14*
U.S. Cl. 74—501 M **31 Claims**



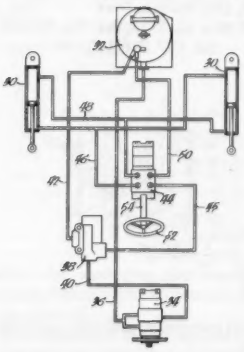
16. An improved control apparatus for an outside, day-night, rearview mirror of the type having reflective surfaces on relative opposite sides thereof and supported within gimbal mounted mirror frame means connected to a control bat through a series of control cables adapted for sychronous pivotal control of said mirror in adjusting the bi-axial field of view and day-night flip configuration thereof, said improvement comprising a mechanical servo adapted for flipping said mirror to respectively identical field of view positions and being interposed between and interconnected with said mirror and control bat and including a housing having a movable transducer assembly mounted therein and coupled thereto in selectable interengagement, which interengagement is responsive to actuation of said control bat for controllably segregating an imparted transducer movement for purposes of flipping said mirror from an imparted transudcer movement for purposes of adjusting the field of view of said mirror.

4,103,561

VEHICLE WITH IMPROVED STEERING SYSTEM

Donald C. Baker, Rosedale, Ind., assignor to J. I. Case Company, Racine, Wis.

Filed Mar. 31, 1977, Ser. No. 783,164
Int. Cl.[2] B62D *1/04*; F16D *31/02*
U.S. Cl. 74—552 **14 Claims**



8. In an articulated vehicle having a forward section and a rear section pivotally interconnected for relative movement about a vertical pivot, hydraulic motor means connected to the respective sections for pivoting said sections about said vertical pivot, a pressurized fluid source, a control member actuatable to supply pressurized fluid from said source to said hydraulic

motor means and an actuator movable about a fixed rotational axis and connected to said control member for actuating said control member, the improvement comprising means within said actuator providing increased mass spaced from said rotational axis for producing increased moment of inertia for said actuator so that a normal input force normally applied to said actuator by an operator will gradually accelerate said pivotal movement of said sections relative to each other and thereby reduce the lateral jerky motion to the operator that is spaced from a reference pivot point for a section having an operator's seat thereon.

4,103,562

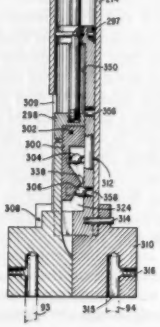
SEWING APPARATUS

Ronald J. Boser, Huntington Station, N.Y., assignor to B & W Manufacturing Co., Inc., New York, N.Y.

Division of Ser. No. 591,948, Jun. 30, 1975, Pat. No. 3,994,246, which is a division of Ser. No. 402,876, Oct. 2, 1973, Pat. No. 3,893,402. This application Aug. 30, 1976, Ser. No. 718,482

Int. Cl.[2] F16H *53/00;* **G05G** *5/06;* **F16H** *25/08, 25/16*

U.S. Cl. 74—567 **7 Claims**



1. A linear motion apparatus with locking comprising

a support having a locking recess formed in a surface thereof;

a member to be moved and locked, said member slidably mounted for movement in a first direction along the support, said member having a bore extending in a second direction transverse to the first direction, said member having a locking element slidably mounted in the member bore for movement in the second direction;

a cam slidably mounted for movement in the first direction relative to both the support and the member, said cam engaging the locking element as so to urge the locking element in the first and second directions when the cam is moved in the first direction;

said locking element when engaged by the cam being slidable along the surface of the support to the locking recess; and

a single linear motor connected to the cam for moving the cam in the first direction whereby the cam applies force in both the first and second directions to the locking element to move the member in the first direction to a first position were the cam urges the locking element into the locking recess to lock the member in the first position.

4,103,563

METHOD AND STRUCTURE FOR ORIENTING A BICYCLE PEDAL

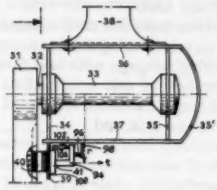
Claude Genzling, 15 Avenue des Cedres, 92410 Ville D'Avray, France

Filed Feb. 17, 1977, Ser. No. 769,694

Claims priority, application France, Dec. 10, 1976, 76 37271

Int. Cl.[2] G05G *1/14;* **B60B** *37/00*

U.S. Cl. 74—594.5 **14 Claims**



2. In a bicycle, rotary crank means having a turning axis about which said crank means rotates during operation of a bicycle, said rotary crank means having a free end region distant from said axis and carrying at said free end region a shaft extending from said crank means in a direction parallel to said axis, pedal means supported by said shaft for free rotation at all times with respect thereto and having an upper surface adapted to be engaged by a sole of a shoe of a cyclist during operating of the bicycle, said pedal means carrying a toe-clip means which extends around the toe region of a shoe which engages the upper surface of said pedal means during operation of the bicycle, and magnetic orienting means operatively connected with said pedal means for automatically orienting the latter magnetically when it is not engaged by a shoe of a cyclist in an attitude where the upper surface of the pedal means is directed upwardly and substantially horizontal at least when said rotary crank means has turned through an angle of approximately 90° beyond a top dead center position of said rotary crank means, and said orienting means acting on said pedal means without inhibiting the freedom of said pedal means to turn with respect to said shaft.

4,103,564

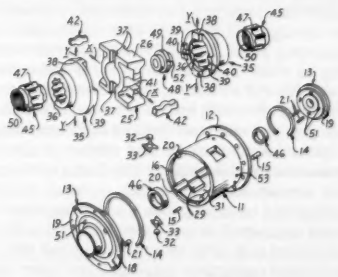
LIMITED SLIP DIFFERENTIAL

Samuel I. Caldwell, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 17, 1976, Ser. No. 751,565

Int. Cl.[2] F16H *35/04*

U.S. Cl. 74—650 **60 Claims**



1. A differential disposed for rotation on a longitudinal axis thereof comprising

a housing,

a slide block,

means mounting said slide block in said housing for rotation

therewith and for permitting said slide block to reciprocate in a first direction perpendicular relative to said axis,

a pair of intermediate members disposed on either side of said slide block and each having first driving means thereon,

interengaging guide means formed on said slide block and on each of said intermediate members for permitting each intermediate member to reciprocate on said slide block in a second direction perpendicular relative to said first direction and relative to said axis,

a pair of driven members each mounted for rotation about said axis on said housing and having second driving means thereon which engage with said first driving means of a respective one of said intermediate members whereby each intermediate member is adapted to orbit in a circular path about said axis, and

means operatively interconnected between said slide block and each of said intermediate members for forcing said driven members to rotate in opposite directions during all phases of differentiation of said differential comprising a pair of cross-over control pivot members disposed on opposite sides of said slide block and pivotally mounted thereon.

4,103,565

ROLL DRIVE FOR PAPER MACHINES AND THE LIKE

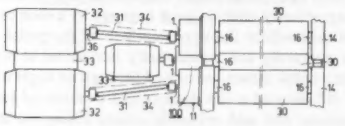
Martti Matikainen, and Juhani Ovaska, both of Jyväskylä, Finland, assignors to Valmet Oy, Helsinki, Finland

Filed Apr. 22, 1976, Ser. No. 679,234

Claims priority, application Finland, Apr. 25, 1975, 751262

Int. Cl.[2] F16H *37/06, 57/02, 1/28*; B21B *35/00*

U.S. Cl. 74—665 L **9 Claims**



1. In a machine which has a roll which is to be rotated about its axis, such as a machine of the type used in connection with the manufacture of paper, said roll having an end situated at a plane which is normal to said roll axis, and support means situated at said plane for supporting said roll at said end thereof for rotation about said axis, planetary gear transmission means situated adjacent to said plane and having an output and an input, connecting means connecting said output of said planetary gear transmission means to said end of said roll for transmitting a drive from said planetary gear transmission means to said roll, and rotary drive means operatively connected with said input of said planetary gear transmission means for driving said roll through said planetary gear transmission means and said connecting means, said planetary gear transmission means including an outer ring gear having inner and outer teeth, an inner sun gear, and a rotary spider means carrying a plurality of planetary gears which extend between and mesh with said inner sun gear and said inner teeth of said outer ring gear, said rotary spider means forming said output of planetary gear transmission mean while said sun gear forms said input thereof, and said support means including an outer stationary ring surrounding said outer ring gear and having inner teeth with which said outer teeth of said outer ring gear mesh, thus providing between said outer stationary ring and said outer ring gear and geared connection supporting said outer ring gear for substantially free movement in a plane containing said outer ring gear, planetary gears, and sun gear, said free movement of said outer ring gear being a non-rotary movement for the purpose of compensating for any inaccuracies which otherwise might be present in the mounting of said planetary gear transmission on said support means, said spider means having a pair of walls between which said planetary gears are located and including bodies extending between and fixed to said walls and situated circumferentially between said planetary gears.

4,103,566

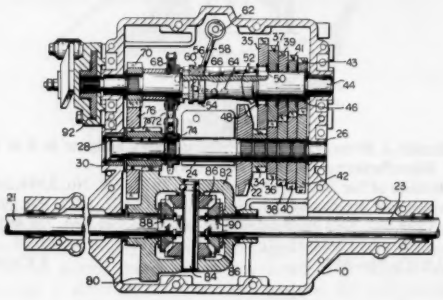
TRANSAXLE

Roland L. von Kaler, Tecumseh, and Norman E. Jolliff, Tipton, both of Mich., assignors to Tecumseh Products Company, Tecumseh, Mich.

Filed Dec. 6, 1976, Ser. No. 747,916

Int. Cl.[2] F16H *37/08*

U.S. Cl. 74—701 **6 Claims**



1. In a transaxle; a housing, a first shaft and an intermediate shaft parallel thereto journalled in said housing, a plurality of sets of meshing gears on said shafts for establishing a plurality of reversing drives at respective ratios between said shafts, a nonreversing drive connecting said shafts, clutch means shiftable to make any one only of said drives effective, and a differential in said housing having an input member, means drivingly connecting said input member to said intermediate shaft, said differential comprising a pair of coaxial output members rotatable on an axis parallel to said shafts, the sets of machine gears on the shafts including first gears nonrotatable on said first shaft and second gears rotatable on said intermediate shaft, said clutch means being slidably supported on said intermediate shaft, said nonreversing drive comprising a first sprocket nonrotatable on the first shaft, a second sprocket rotatable on said intermediate shaft, and a chain entrained about the sprockets, said second sprocket being on the opposite axial side of said clutch means from said second gears, and being engageable by the clutch means only when the clutch means is fully disengaged from said second gears.

4,103,567

DIFFERENTIAL PINION ASSEMBLY, ESPECIALLY FOR MOTOR VEHICLES

Colanzi Franco, and Sapello Guido, both of Turin, Italy, assignors to SKF Industrial Trading and Development Company N.V., Jutphaas, Netherlands

Filed Jun. 14, 1976, Ser. No. 695,857

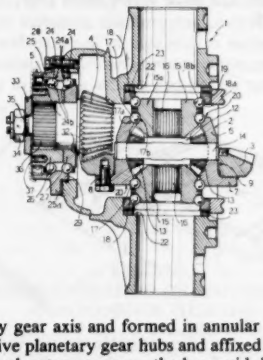
Claims priority, application Italy, Jun. 20, 1975, 68591 A/75

Int. Cl.[2] F16H *1/38*

U.S. Cl. 74—710 **1 Claim**

1. A differential pinion assembly adapted to transmit rotation from a source of mechanical power to two aligned axle-shafts, comprising a box inside which a differential carrier rotates on the shaft axes and actuated by a driving toothed pinion engaging with a crown gear affixed to and concentric of the differential carrier, such differential carrier carrying satellite gears rotatable with respect to the carrier and meshing with a pair of planetary gears on the shaft axes, each of said planetary gears being adapted to be affixed to a respective one of said axle shafts, said differential carrier having an inside recess accommodating such planetary and satellite gears, and the differential carrier having a pair of aligned axial openings concentric of the shaft axes, each of said planetary gears having a hub projecting

through a respective one of said openings and outwardly of the differential carrier, said planetary gears having external peripheral surfaces defining two adjacent raceways spaced axially from each other, one of said raceways guiding a first row of rolling bearing elements and the other of said raceways guiding a second row of rolling bearing elements, said first rows of rolling bearing elements on the respective planetary gear hubs also being guided in first raceways on the differential carrier and respectively located on opposite sides of the carrier at the peripheries of the axial openings to mount and carry the differential carrier on such planetary gears, and said second rows of rolling bearing elements on the respective planetary gear hubs also being guided in second raceways concentric of



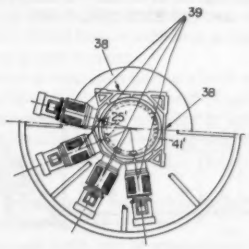
the planetary gear axis and formed in annular elements adjacent respective planetary gear hubs and affixed to the box and carrying the planetary gears on the box, said driving toothed pinion being solid with a driving shaft supported during rotation with respect to the box by means of a pair of rows of rolling bearing elements rolling on raceways provided in an annular element affixed to said box, the shaft having two concentric rings affixed thereto, each of said rings having a raceway for such rolling elements, said rings engaging each other and axially against a shoulder of the shaft, and one of the rings having axial grooves on its inner periphery receiving axial projections on the periphery of said shaft and also having axial holes for connection of the rings with such a source of mechanical power by which the assembly is driven.

4,103,568

MODULAR KINEMATIC CHAIN FOR TRANSMITTING A TORQUE WITH SLIP

Michel Bérard, and André Lecoustey, both of Belley, France, assignors to Cefilac, Paris, France

Filed Dec. 2, 1976, Ser. No. 746,949
Claims priority, application France, Dec. 18, 1975, 75 39640
Int. Cl.[2] F16H *1/28*
U.S. Cl. 74—801 **10 Claims**



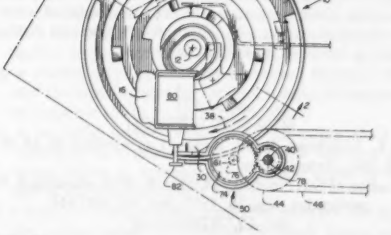
1. A modular kinematic chain for transmitting a torque, with slip and speed reduction, to a member which is rotated, characterized in that it comprises; at least one motor-coupling group consisting of a standard motor, a hysteresis coupling means with permanent magnets, and an output shaft, at least one complementary reducing cell coaxial with the output shaft of a motor-coupling group and having an output shaft drivingly engaged with the motor-coupling group output shaft, and a basic convertible reducing mechanism including a casing containing an aperture, an output shaft for passage through said aperture, and at least two holes for selectively receiving a motor-coupling group, and associated complementary reducing cell, the output shaft of the reducing mechanism being driven by the output shaft of the reducing cell by means of a mechanical reducing arrangement.

4,103,569

PROGRAMMING CAM INDEXING MECHANISM

Paul W. Thomas, Duxbury, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 3, 1977, Ser. No. 756,381
Int. Cl.[2] B23B *29/24;* B23Q *17/00*
U.S. Cl. 74—816 **13 Claims**



1. An indexing mechanism comprising:

a programming member having means for defining an outer traction surface and an inner track surface spaced from said outer traction surface, said inner track surface having notches formed therein and spaced to establish successive indexed positions;

a rotatable drive shaft supported on a first axis parallel to and spaced from said outer traction surface;

a latch member pivoted on said first axis;

a capstan supported from said latch member for swinging movement therewith about said first axis and for rotation on a second axis parallel to and spaced from said first axis and said outer traction surface;

bracket means movable with said latch member and capstan and defining a latch tab engageable with said inner track, said latch tab being positioned with respect to said inner track, said first axis and said capstan to maintain a pivotal position of said latch member on said first axis to hold said capstan in frictional engagement with said outer traction surface when said latch tab is engaged with said inner track and to space said capstan from said outer traction surface when said latch tab is engaged in one of said notches;

means to move said latch tab out of said notches by pivoting said latch member on said first axis to move said capstan into engagement with said outer traction surface; and

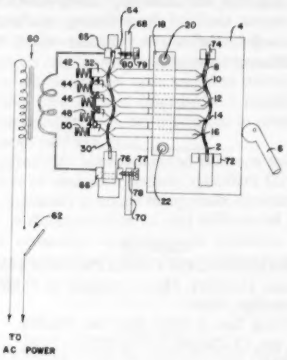
means driveably coupling said capstan with said drive shaft.

4,103,570

METHOD OF AND APPARATUS FOR MAKING A SHEET METAL ZIG-ZAG KEY

Jacob Rabinow, Bethesda, Md., assignor to Hall & Myers, Potomac, Md., a part interest

Filed Feb. 22, 1977, Ser. No. 770,485
Int. Cl.[2] B21D *53/42*
U.S. Cl. 76—110 **9 Claims**



1. The method of making a key of the type that is used to open a lock, from a blank, that comprises a strip of metal, comprising:

heating said blank, to a plastic state, and

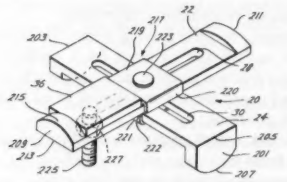
converting said blank into a key of the type used to open a lock comprising deforming said blank from a flat plane to give the blank curvature and provide displaced areas at given locations along its length, to give desired displacement to tumblers by said areas.

4,103,571

HUB NUT WRENCH

Robert L. Matthews, Baton Rouge, La., assignor to M & M Tools, Inc., Baton Rouge, La.

Continuation of Ser. No. 664,948, Mar. 8, 1976, abandoned. This application Jun. 20, 1977, Ser. No. 807,814
Int. Cl.[2] B25B *13/48*
U.S. Cl. 81—74 **12 Claims**



1. A wrench for removing a polygonal sided nut from a threaded axle located within a wheel hub comprising:

a connector having a central pivot pin;

at least a pair of elongated members each having an axial slot, said members being mounted in said connector such that said elongate members are in intimate contact with one another and such that said elongate members are slidable and rotatable with respect to one another and are slidable with respect to said connector, said pivot pin passing through the slot of each said elongated member; and

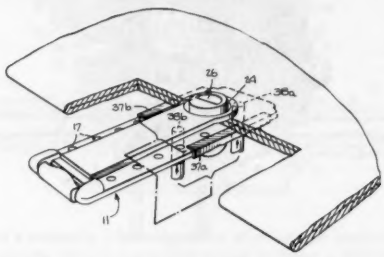
at least one nut engaging portion at the end of at least one of said slotted elongated members, said nut engaging portion having a flat lateral face parallel to the longitudinal axis of said elongated member, and an outwardly curved surface opposite said lateral face, said curved surface having for its axis of curvature a line substantially parallel to the longitudinal axis of said longitudinal member; whereby said nut engaging portion may be inserted within a wheel hub such that such curved surface contacts the inner surface of the hub and the flat surface is proximate one facet of said axle nut.

4,103,572

UNLATCHING TOOL FOR REUSABLE SECURITY TAG

David Raymond Humble, Plantation, Fla., and Harry Godfrey Walters, III, Lancaster, Pa., assignors to Sensormatic Electronics Corporation, Hollywood, Fla.

Division of Ser. No. 428,827, Dec. 27, 1973, Pat. No. 3,942,829. This application Jul. 25, 1975, Ser. No. 599,081
Int. Cl.[2] B23P *19/04*; B25B *7/02*
U.S. Cl. 81—418 **1 Claim**



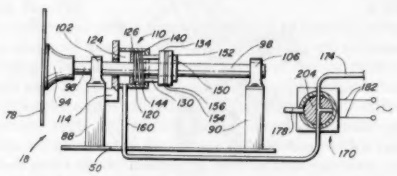
1. An unlatching tool for a reusable security tag of generally flat rectangular configuration with opposite broad surfaces extending between substantially parallel side edges, comprising in operationally interconnected relationship a pair of confronting jaws spaced apart and arranged to straddle said tag with a close fit alongside said side edges, each jaw having a portion for disposition alongside a corresponding side edge and an inwardly directed lip projecting toward the other jaw but not connected thereto for overlying and engaging a given one of the broad surfaces of said tag to prevent movement of said tag from between said jaws in a direction past said lips, and a pair of spaced apart fingers mounted for oppositional movement relative to the lips of said jaws for engaging the other broad surface of said tag to apply pressure to said tag against the restraint of said jaw lips, said fingers being located in a plane passing between said jaws so as to engage said tag to points on a line which is spaced from and substantially parallel to said portions of said jaws.

4,103,573

BRAKING SYSTEM FOR ROLL-CUTTING KNIFE

Richard L. Witcraft, Park Ridge, Ill., assignor to Unipat Corporation of America II, Harwood Heights, Ill.

Filed Sep. 15, 1977, Ser. No. 833,551
Int. Cl.[2] B23B *3/04, 7/00*
U.S. Cl. 82—93 **5 Claims**



1. In a tape slitting machine including mandrel means and means rotatably supporting said mandrel means to turn a core wound roll of tape to be cut, blade means including a circular

blade for slitting the roll of tape to provide a plurality of narrower roll strips, carriage means and drive means for moving said blade toward and from said roll of tape to cut therethrough a transform the roll of tape into a series of incremental roll strips, and

means supporting said blade for rotation about a center thereof:

the improvement comprising clutch means for locking said blade against rotation upon entry of said blade edgewise radially into cuttingly to engage an annular peripheral margin of a roll of tape to be cut into incremental roll strips, and

means to release said clutch means to allow free rotation of said blade upon engagement of said blade with and positive entry of a leading edge thereof into said roll of tape,

to promote sustained, uninterrupted positive contact of said blade with said roll of tape and to minimize disruptive, detrimental, sporadic multiple engagement therebetween, thereby to obviate nicking and double cutting of the roll of tape.

4,103,574

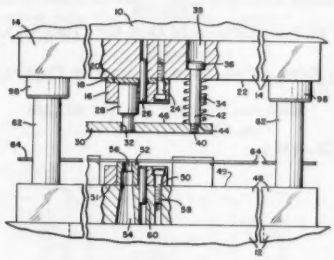
TOOL ASSEMBLY, METHOD OF MANUFACTURE AND COMPONENTS THEREOF

H. William Greer, 18 Patti Ct., Franklin, Ohio 45005

Filed Aug. 1, 1974, Ser. No. 493,757

Int. Cl.[2] B26F *1/14*

U.S. Cl. 83—140 **19 Claims**



14. An improved tool assembly comprising:

(a) a tool retainer having inner and outer faces,

(b) a tool receiving socket in said retainer,

(c) means for fixing a tool in said socket,

(d) a plurality of bolt holes in said retainer,

(e) a backing shoe having inner and outer faces,

(f) a plurality of bolt holes in said shoe in alignment with said bolt holes in said retainer,

(g) a plurality of bolts each having a head and a leading end received in said bolt holes in said retainer and said shoe and securing said retainer to said shoe with said inner face of said shoe adjacent said inner face of said retainer,

(h) means defining tool engageable sockets in the heads of said bolts, and

(i) means defining tool engageable sockets in the leading ends of said bolts,

(j) whereby said bolts can be manipulated from said outer face of said shoe during initial assembly of said shoe and retainer and said bolts can be manipulated from said outer face of said retainer after said assembly thereof to facilitate retainer removal and replacement.

4,103,575

SYNCHRONOUS WEB CUTTING APPARATUS

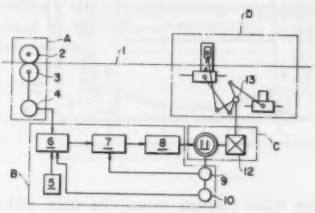
Masaaki Utsui; Hikaru Tsuruta; Shigemitsu Mizutani, and Shigehisa Shimizu, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 28, 1977, Ser. No. 819,918

Claims priority, application Japan, Jul. 29, 1976, 51-90494

Int. Cl.[2] B23D *25/04*

U.S. Cl. 83—298 **3 Claims**



1. An apparatus for cutting a web travelling at a constant speed into desired lengths, comprising:

a. a first slider movable in a direction parallel to the web,

b. a first cutting member mounted on the first slider on one side of the web,

c. a second slider mounted on the first slider and movable in a direction perpendicular to the web,

d. a second cutting member mounted on the second slider on the other side of the web for reciprocating engagement with the first cutting member to cut the web,

e. a rotary drive shaft,

f. a drive mechanism connected between the shaft and the first slider for reciprocatingly driving the latter in response to the rotation of the shaft,

g. a second drive mechanism connected between the shaft and the second slider for reciprocatingly driving the latter in response to the rotation of the shaft,

h. a movable torque balancer for offsetting shaft torque variations in a cutting region whereat the first slider is being driven at substantially the same speed as the web and in the same direction, and

i. a third drive mechanism connected between the shaft and the torque balancer, whereby the shaft torque and first slider speed remain substantially constant throughout the cutting region.

4,103,576

FLYING CROSS CUTTING SHEAR FOR PLATE

Willi Benz, Neuss, Fed. Rep. of Germany, assignor to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 17, 1977, Ser. No. 769,683

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1976, 2611988

Int. Cl.[2] B26D *1/56*

U.S. Cl. 83—320 **6 Claims**

1. Flying cross-cutting shear for cutting a moving strip, comprising

a stationary frame,

guides on the frame,

a blade carriage guided on the guides,

a pair of opposite blade carriers mounted in the blade carriage and movable therewith in the direction of movement of the strip,

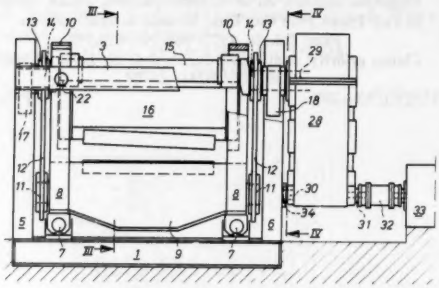
blades mounted in each of the carriers,

a crankshaft for moving one of the blade carriers towards and away from the plane of the strip to carry out cutting actions,

bearing means in the stationary frame,

cam discs mounted at ends of the crankshaft and contacting the bearing means so as to guide the blade carriage, when

the crankshaft turns, in the direction of movement of the strip at the same time as the crankshaft is moving said one



of the blade carriers to cut the strip, and guide links, supported on the blade carriage, in which the crankshaft is journalled.

4,103,577

SHEARS

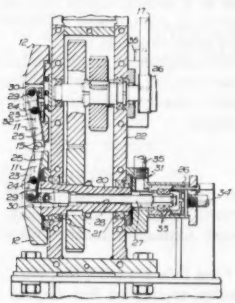
John Charles Jackson, and Percy Bruce Gordon Selous, both of Sheffield, England, assignors to Ashlow Steel & Engineering Company Limited, Sheffield, England

Filed Feb. 3, 1977, Ser. No. 765,388

Claims priority, application United Kingdom, Feb. 17, 1976, 6107/76

Int. Cl.[2] B26D *3/22*; B23D *25/12*

U.S. Cl. 83—337 **4 Claims**



1. A shearing device for cutting rod comprising a pair of blades projecting one from each of a pair of coplanar discs between which the rod is adapted to pass, means for rotating the discs continuously such that at the positions of closest approach of the blades to the path of the rod the tips of the blades move in the direction of motion of the rod and with exactly the same linear speed as the rod, each blade being pivotally mounted in a groove in its disc to move to either side of a plane perpendicular to the axis of rotation of its disc between an operative position on one side of said plane in which the path of the tip of the blade will intersect with the path of the rod and an inoperative position on the opposite side of said plane in which the path of the tip of the blade will pass clear of the path of the rod, and a pair of double-acting air cylinders for moving the blades between the aforesaid positions.

4,103,578

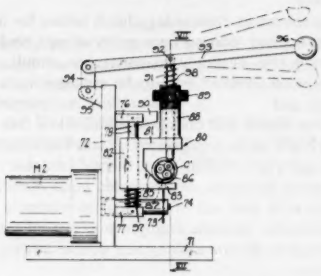
CABLE ARMOR CUTTING MACHINE

Lucien C. Ducret, 8 Apache Pl., Riverside, Conn. 06878

Filed Jul. 8, 1976, Ser. No. 703,669

Int. Cl.[2] B26D *7/02*

U.S. Cl. 83—409 **2 Claims**



1. A cable armor cutting machine comprising, a fixed support, a motor mounted on said support, a saw operatively connected to said motor, at least one vertical shaft mounted on the support, a cable guide slidable on said shaft toward and away from said saw, a cable clamping means movable into and out of engagement with the cable, and operating means adapted to move the clamping means into engagement with the cable and to move the cable into cutting engagement with the saw, the cable guide being a laterally open-faced block provided with a vertically disposed bushing, the clamping means being a plunger slidable in said bushing, and the operating means being a lever pivotally connected at one end to the fixed support.

4,103,579

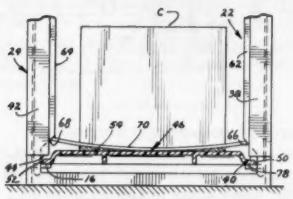
DEVICE FOR SLICING A BLOCK OF CHEESE AND THE LIKE

Blaine F. Rowe, Edina, Minn., assignor to Plastics, Inc., St. Paul, Minn.

Filed Jun. 16, 1977, Ser. No. 807,246

Int. Cl.[2] B26D *7/06, 4/12*

U.S. Cl. 83—435.1 **5 Claims**



1. A device for slicing a block of cheese and the like comprising:

(a) a base having

(b) spaced flanges carried thereby,

(c) a pallet for mounting a block of cheese or the like thereon,

(d) means slideably mounting said pallet on said flanges,

(e) a cutter,

(f) means slideably mounting said cutter on said base normal thereto,

(g) said cutter having a frame including first and second spaced legs,

(h) a wire member secured at one end to said first leg and at the other end to said second leg under compression so as to be positioned convexly toward said pallet and contactable with said pallet with the pallet tangentially thereof so

that the entire length of the wire member is pressed through a block of cheese to a position upon and extending completely across the pallet.

4,103,580

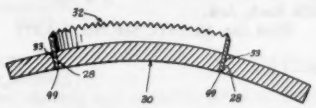
DIE BOARDS AND METHOD OF PRODUCING CUTTING RULE FOR SAME

Louis E. Sauer, and Orville C. Miller, both of St. Louis, Mo., assignors to L.E. Sauer Machine Co., St. Louis, Mo.

Continuation of Ser. No. 318,220, Dec. 26, 1972, abandoned, which is a continuation-in-part of Ser. No. 184,248, Sep. 27, 1971, abandoned, which is a division of Ser. No. 840,384, Jul. 9, 1969, Pat. No. 3,696,480. This application Jun. 27, 1974, Ser. No. 483,530

Int. Cl.[2] B26F *1/44*

U.S. Cl. 83—663 **2 Claims**



1. A die assembly comprising a die board having round holes therein, the spacing and pattern of which define a preselected design, routing between said holes, and die rule having dependent tangs spaced along its length at locations to match at least some of the holes, said tangs being received in said holes and having portions with corners which engage the walls of said holes, said routing snugly receiving said die rule and accurately positioning the same.

4,103,581

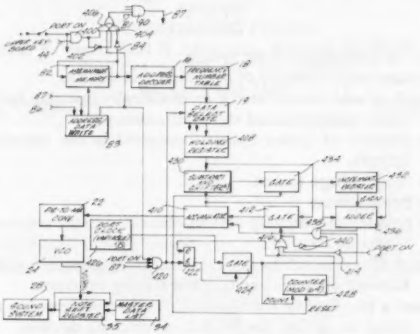
CONSTANT SPEED PORTAMENTO

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawaii Musical Instrument Mfg. Co., Hamamatsu, Japan

Filed Aug. 30, 1976, Ser. No. 718,791

Int. Cl.[2] G10H *1/02*

U.S. Cl. 84—1.24 **12 Claims**



1. In a keyboard operated tone synthesizer in which the pitch of each note generated by the synthesizer is determined by a frequency control number stored in a table, the number being selected by operation of the associated key and used to set the frequency of an oscillator which fixes the fundamental frequency of the generated tone, a portamento control comprising:

accumulator means for storing a frequency control number,

means responsive to operation of any selected key on the keyboard for selecting a corresponding frequency control number from said table,

means subtracting the selected number from said table from the number in said accumulator means,

means responsive to the operation of the selected key and to the subtracting means for periodically changing the number in the accumulator means in increments corresponding to a predetermined fraction of the output of the subtracting means,

means interrupting the means periodically changing the number in the accumulator when the number in the accumulator is incremented a predetermined number of times, and

means responsive to the contents of the accumulator means for generating a musical tone having a fundamental frequency fixed by the value of the number stored in the accumulator means.

4,103,582

ELECTRONIC MUSICAL INSTRUMENT

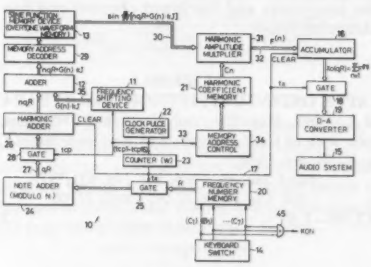
Masanobu Chibana, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 24, 1977, Ser. No. 780,752

Claims priority, application Japan, Apr. 2, 1976, 51/36756

Int. Cl.[2] G10H *1/02*

U.S. Cl. 84—1.24 **2 Claims**



1. In an electronic musical instrument of the class wherein amplitude sample values of a tone at successive sampling points of a musical tone waveform are calculated by independently calculating sample values of respective partials that constitute said musical tone waveform and then adding the calculated partial values, the improvement which comprises:

a variable generating circuit which generates a variable which varies with time, and

a variable-modifying circuit which modifies said variable with a coefficient corresponding to each partial thereby independently modifying the normal frequency of each one of the corresponding partials in accordance with the output from said variable modifying circuit, and wherein

said variable-generating circuit comprises a circuit for generating a value kJ which varies with time, and a circuit for changing the period of said value kJ with time, and

said variable modifying circuit comprises a circuit for generating frequency deviation coefficients $G(n)$ respectively corresponding to the order n of said partials, and a multiplier that multiplies said variable kJ with said coefficients $G(n)$ thereby modifying said period for respective partials such that the normal frequencies of respective partials are modified independently by amounts corresponding to the varied period of respective partial outputs $G(n)kJ$ from said multiplier.

4,103,583

ELECTRIC GUITAR

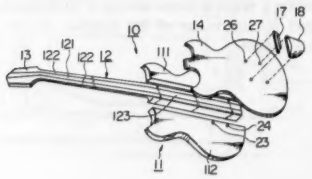
Yojiro Takabayashi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Jul. 19, 1976, Ser. No. 706,153

Claims priority, application Japan, Jul. 18, 1975, 50/99072[U]; Jan. 10, 1976, 51/1703[U]

Int. Cl.[2] G10D *1/08*

U.S. Cl. 84—291 **15 Claims**



1. An electric guitar comprising:
an elongated neck formed of a plurality of elongated pieces, one of said elongated pieces being formed of a harder material than the remaining of said elongated pieces, said one of said elongated pieces extending throughout substantially the entire longitudinal length of said neck;
a body coupled to said neck, said neck extended a substantial distance into said body;
a top board covering at least a part of the surface of said body, said top board being made of a harder material than said body and contacting said one of said elongated pieces;
a bridge element attached to said top board in a portion of the area where said top board contacts said one of said elongated pieces.

4,103,584

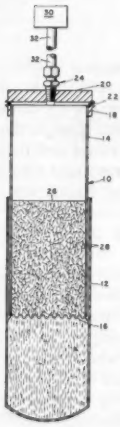
STAPLE ORIENTING METHOD AND APPARATUS

Edwin L. Lista, Roseville, and Kenneth S. Williams, Sacramento, both of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Filed Jan. 18, 1966, Ser. No. 521,757

Int. Cl.[2] F42B *33/10*; C06B *21/00*

U.S. Cl. 86—1 R **2 Claims**



1. A method of orienting metal staples dispersed in a solid propellant which comprises the steps of:
(a) filling a bayonet having a screen at the bottom thereof with uncured solid propellant having metal staples randomly dispersed therein;
(b) forcing the uncured propellant through the bayonet screen to orient the metal staples within the solid propellant; and
(c) vibrating the screen as the propellant is forced therethrough to impart a radial moment to the propellant leaving said screen.

4,103,585

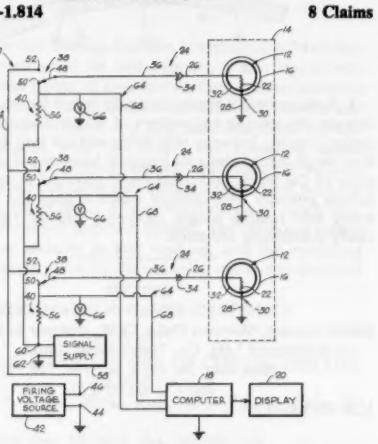
AMMUNITION FIRING SYSTEM HAVING MEANS FOR ELECTRICALLY SIGNALING PRESENCE OR ABSENCE OF AMMUNITION

Nelson D. Foley, Little Rock, Ark., assignor to Bei Electronics, Inc., Little Rock, Ark.

Filed Jan. 18, 1977, Ser. No. 760,377

Int. Cl.[2] F41F *3/04*

U.S. Cl. 89—1.814 **8 Claims**

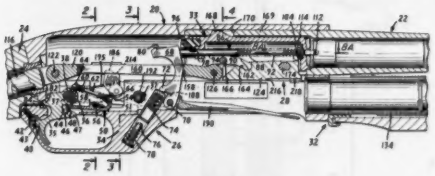


1. An ammunition firing system,
comprising a plurality of rounds of ammunition,
each of said rounds having an electrically operable igniter with a predetermined electrical resistance,
a plurality of igniter circuits connected to the respective igniters,
a firing voltage source,
a signal source,
a plurality of switching devices connected to the respective igniter circuits,
each of said switching devices being independently operable between a signal condition and a firing condition,
and a plurality of signal circuits connected between said signal source and the respective switching devices,
each switching device including means operative in said signal condition for connecting the corresponding igniter circuit to the corresponding signal circuit,
each signal circuit including a current limiting impedance for limiting the signal current supplied by said signal source to the corresponding igniter to a low value which is insufficient to fire the round of ammunition,
each signal circuit including indicating means for indicating the presence or absence of the signal current between said signal source and the corresponding igniter,
each switching device including means operative in said firing condition for connecting the corresponding igniter circuit to said firing voltage source for firing the round of ammunition.

4,103,586
FIREARM TRIGGER MECHANISM

James Tollinger, Ithaca, N.Y., assignor to Ithaca Gun Company, Inc., Ithaca, N.Y.

Division of Ser. No. 525,072, Nov. 19, 1974, Pat. No. 4,014,247.
This application Dec. 22, 1976, Ser. No. 753,190
Int. Cl.[2] F41C *19/00*
U.S. Cl. 89—144 1 Claim

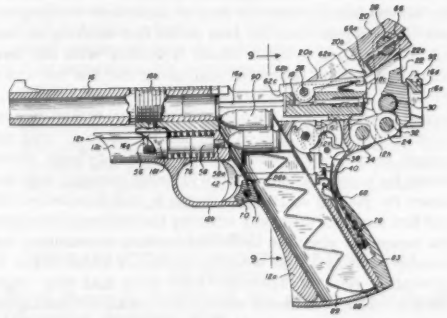


1. A trigger disconnect for a firearm, comprising:
a trigger housing,
a member slidably and rotatably mounted in the trigger housing and including a hammer sear for engaging a hammer and a trigger sear for engaging a trigger;
a hammer having a catch engageable with said hammer sear, and a hammer biasing spring operating to urge said member for rotation in one direction when said hammer sear on said member is engaged with said hammer;
a biasing spring acting on said member to bias said member for rotation in the other direction; and
a trigger catch on said trigger engageable with said member trigger sear when said member is rotated to the full extent possible in the said one direction but disengaged therefrom when said member is rotated to the full extent in the said other direction;
said trigger housing further comprising an abutment member on said member and a pin mounted above said member against which said member abuts in the extreme forward sliding position under the influence of said member spring and about which said member rotates.

4,103,587
AUTOLOADING PISTOL

Chester F. Vanek, 5154 N. Lotus Ave., Chicago, Ill. 60630

Filed Oct. 6, 1976, Ser. No. 729,894
Int. Cl.[2] F41D *3/02*
U.S. Cl. 89—175 13 Claims

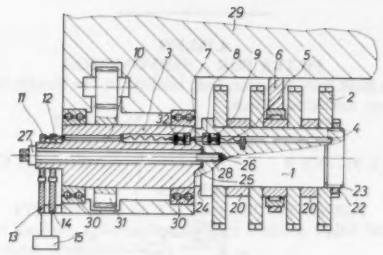


1. A pistol having a frame with longitudinally directed guides in its sides, a barrel assembly and including a barrel extension mounted on said frame, said which extension is slidable in said guides and having a rear portion of said extension also formed with longitudinally directed guides, a bolt behind the barrel and slidable along the guides of the extension, front and rear toggle links pivotally joined together behind the bolt, the front link pivotally attached to the bolt, the rear link pivotally attached to the rear of said frame, a passive firing pin slidable in bolt and a firing impulse transmittance pin in the front toggle link and aligned with the firing pin when the toggle is open, the transmittance pin having a depending leg which is contacted by the rear of the bolt to hold the pin in the link when the toggle is closed and to project the pin from the rear of the link into the striking path of a hammer when the toggle is open.

4,103,588
CRANKSHAFT MILLING MACHINE AND MILLING TOOL FOR SUCH MACHINE

Karlheinz Schmid, Neckartenzlingen, Fed. Rep. of Germany, assignor to Gebrueder Heller, Maschinenfabrik Gesellschaft mit beschraenkter Haftung, Nuertingen, Fed. Rep. of Germany

Filed Jun. 23, 1977, Ser. No. 809,430
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1976, 2630047
Int. Cl.[2] B23C *5/08*
U.S. Cl. 90—11 A 7 Claims

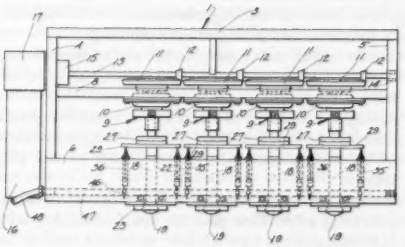


1. A milling tool comprising arbor means, milling discs, means securing said milling discs in spaced relationship on said arbor means, electric heating means operatively disposed inside said arbor means, and electric conductor means operatively disposed to contact said electric heating means and to be accessible from the outside of said arbor means.

4,103,589
MULTIPLE SPINDLE DIVIDING HEAD

Walter C. Francis, Newport News, Va., assignor to Trans-ACC, Inc., Cincinnati, Ohio

Filed Sep. 15, 1976, Ser. No. 723,242
Int. Cl.[2] B23B *31/30*; B23Q *17/04*
U.S. Cl. 90—56 R 6 Claims



1. A multiple spindle dividing head comprising a housing, a plurality of spindles rotatably mounted in said housing, a common drive shaft in said housing, gear means operatively connecting said spindles to said drive shaft, actuator means operatively connected to said drive shaft for rotating said spindles, split ring collets having work-piece receiving openings therein

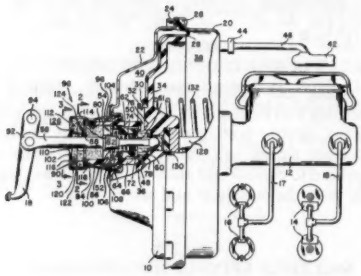
operatively connected to said spindles for rotation therewith, means mounting said collets for axial movement relative to said spindles, said collets having tapered heads at their forward ends projecting through openings in said housing, bearing collars mounted on said housing and surrounding the heads of said collets, said bearing collars having tapered surfaces engaging the tapered heads of said collets, face plates surrounding said collets, said face plates being operatively connected to said collets to displace them axially rearwardly, pairs of fluid cylinders on opposite sides of each of said collets extending in parallel relation thereto, said cylinders containing rearwardly projecting piston rods positioned to contact said face plates upon movement from a retracted to an extended position, and means for supplying fluid under pressure to said cylinders to displace said piston rods rearwardly, whereby the tapered heads of the collets are radially contracted by the tapered surfaces of said bearing collars as said collets are displaced from a forward work-piece receiving position to a rearward work-piece clamping position by the piston rods as they bear against said face places, said face plates permitting said collets to rotate while maintained in their work-piece engaging position.

4,103,590

FILTER FOR A SERVOMOTOR

James Basil Putt, Granger, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 10, 1977, Ser. No. 776,393
Int. Cl.[2] F15B *9/10, 25/02, 21/04*
U.S. Cl. 91—376 R **7 Claims**



1. In a servomotor having a housing with a wall means movable therein moved by a pressure differential created between a first fluid and a second fluid to produce an output force, said first fluid being communicated into said housing by flowing through a passageway in a hub upon movement of a control valve by an input push rod responding to an operator input, flow means for assuring communication of said first fluid from a source to said passageway comprising:

a boot having an end closure section and a body section, said body section being fixed to said housing and said closure section surrounding said push rod, said closure section having a first series of openings substantially parallel to said passageway, said body section having a second series of openings substantially perpendicular to said passageway;

first filter means adjacent said first series of openings for providing a first flow path for said first fluid in said passageway; and

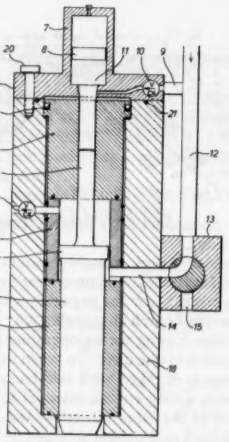
second filter means adjacent said second series of openings for providing a second flow path for said first fluid in said passageway, said first and second flow paths merging into a single flow path adjacent said passageway in order that the flow of the first fluid into said passageway is substantially the same irrespective of the selected flow path traversed in reaching the passageway.

4,103,591

DEVICE FOR A HYDRAULICALLY DRIVEN PERCUSSION HAMMER

Olav L. Reiersdal, Sandvatn st., 4480 Kvinesdal, Norway

Filed Aug. 30, 1976, Ser. No. 719,011
Int. Cl.[2] F15B *15/17, 21/02*
U.S. Cl. 91—417 R **4 Claims**



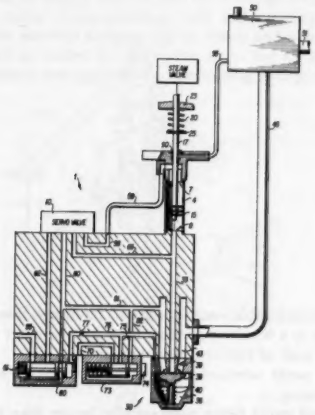
1. An hydraulically driven percussion device for actuating a tool, comprising means defining a cavity having first, second and third coaxial cylindrical regions of which the first and second regions are of smaller diameter than the third region, a differential piston having first and second end portions and an intermediate portion fitted slidingly in the first, second and third regions respectively of the cavity, the first end portion having two ends, one of which is further from the second end portion than is the other, and the intermediate portion having two end surfaces, one of which is further from the first end portion and gains the intermediate portion to the second end portion and the other of which is further from the second end portion and gains the intermediate portion to the first end portion, the piston having two working surfaces of which a first is constituted by said one end of the first end portion and of which the second is constituted by said one end surface of the intermediate portion, the area of the second working surface being greater than the area of the first working surface, means defining a cylinder which is coaxial with the three coaxial cylindrical regions of said cavity and has one end in direct communication with said first region of the cavity, a second piston fitted slidingly in said cylinder, resiliently compressible means effective on said second piston to urge said second piston toward said one end of said cylinder source means for supplying hydraulic fluid under pressure, first duct means for placing said source means in communication with said first region of the cavity whereby the resiliently compressible means are placed in hydraulic pressure-transmitting relationship with said first working surface, a check valve for preventing flow of hydraulic fluid from said first region towards said source means, second duct means for placing said source means in communication with the second working surface, and a multiple way valve defining a discharge outlet and having a first position in which the source means communicate with the second working surface via said second duct means and both the source means and the second duct means are shut off from the discharge outlet and a second position in which the source means are shut off from the second working surface and the second duct means communicate with said discharge outlet.

4,103,592

VALVE OPERATOR

Donald H. Davis, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 642,396, Dec. 19, 1975, abandoned.
This application Dec. 23, 1976, Ser. No. 754,055
Int. Cl.[2] F15B *11/08, 13/04*
U.S. Cl. 91—448 3 Claims



1. A valve operator for providing remote control of a controlled valve which is both fast closing and slowly positionable; said valve operator comprising:

a double-acting hydraulic cylinder having first and second opposite, open ends with a valve actuating piston slidable therebetween, said valve actuating piston biased by a spring in the valve close direction and including a rod connectable to a controlled valve;

a hydraulic manifold including a servo valve in fluid communication with each opposite end of said hydraulic cylinder whereby an input of hydraulic fluid to the first end of said hydraulic cylinder moves the controlled valve toward a closed position and the input of hydraulic fluid to the second end of said hydraulic cylinder moves the controlled valve toward a valve open position;

a disk-dump valve in fluid communication with the second end of said hydraulic cylinder;

a drain tank in fluid communication with the second end of said hydraulic cylinder through said disk-dump valve;

sealing means in fluid communication with the first end of said hydraulic cylinder, said sealing means circumferentially positioned about the valve actuating piston rod; and,

a fluid supply conduit interconnecting the drain tank and sealing means, the fluid level in said drain tank being maintained at a level sufficient to apply fluid pressure to said seal means, whereby fluid from the second end of said hydraulic cylinder may be dumped to said drain tank through said disk-dump valve whereupon it pressurizes said sealing means through said fluid supply conduit.

4,103,593

HYDRAULIC BRAKE BOOSTER AND SHIELD THEREFOR

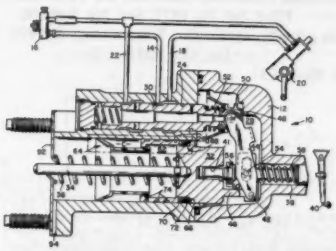
Arthur K. Brown, Jr., South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 15, 1976, Ser. No. 732,573
Int. Cl.[2] F15B *21/04;* F16J *15/18*
U.S. Cl. 92—78 7 Claims

1. A hydraulic brake booster comprising:

a housing defining a pressure chamber;

a piston slidably mounted in a bore in said housing, said piston being responsive to increasing pressure in the pressure chamber to move a shield connecting the piston with a wall of the housing bore in a non-braking position, which said piston moves during braking to isolate that portion from atmosphere, said shield also sealingly and



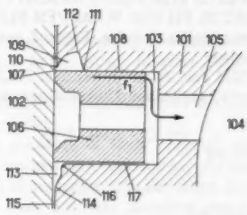
slidingly engaging the wall of the housing bore, said shield being engageable with said piston when the latter is in the non-braking position and being spaced from said piston when said piston moves to a braking position.

4,103,594

PISTON AND SCRAPER RING ASSEMBLY

Robert Geffroy, 1, Boulevard Richard Wallace, 92200 Neuilly-sur-Seine, France

Filed Jun. 17, 1974, Ser. No. 480,191
Claims priority, application France, Jun. 26, 1973, 73 23318
Int. Cl.[2] F01M *11/02;* F16J *1/08*
U.S. Cl. 92—159 13 Claims



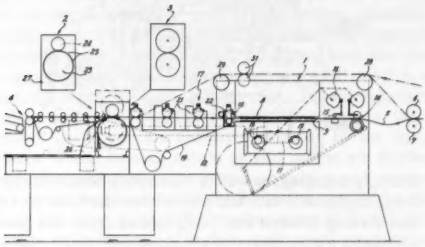
1. A crowned reciprocating engine piston having at least one peripheral groove containing a scraper ring dimensioned with relative clearance permitting axial shifting of said ring within said groove and said ring having peripheral scraping lips thereon, one of which is relatively nearer the piston crown, a recess in said piston in a position adjoining said one scraper lip, said recess defining a reservoir extending closer to said piston crown than any outlet for oil collected therein, an oil recovery lip formed at the circumferential face of the piston and bounding one side of the recess and disposed in closely spaced relation to said one scraper lip, said reservoir being adapted to cooperate with said one scraper lip and said oil recovery lip to collect oil from a cylinder wall during a limited portion of said piston's reciprocating cycle, and with a clearance open during a different limited portion of said cycle between those adjacent sides of said ring and said groove which are closer to the crown of the piston providing communication for the collected oil from said recess to said groove, and an outlet from the groove.

4,103,595

CUTTING MACHINES FOR CUTTING UP A WEB OF MATERIAL SUCH AS PAPER OR CARDBOARD

Louis Gaston Corse, Chaumont sur Tharonne, France, assignor to Machines Chambon, Chaumont sur Tharonne, France

Filed Jul. 26, 1977, Ser. No. 819,000
Claims priority, application France, Aug. 5, 1976, 76 23914
Int. Cl.[2] B31B *1/14*
U.S. Cl. 93—58.3 9 Claims



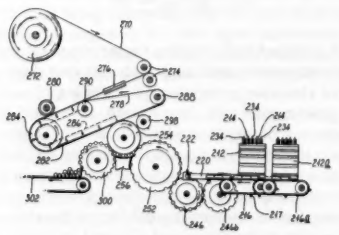
1. A machine for cutting up a web of material, the machine comprising three units arranged along the path of movement of the web through the machine, the first unit being a flat cutting press, the second unit being a rotary peeling apparatus, and the third unit being a reception unit for cut sheets of web material, a fourth unit being provided as a replacement for the second unit, the fourth unit being a rotary cutting apparatus, wherein means are provided for by-passing the first unit when the fourth unit replaces the second unit.

4,103,596

APPARATUS FOR FEEDING AND CUTTING CIGARETTE FILTER WRAPPER MATERIAL

Desmond Walter Molins, London, England, assignor to Molins Limited, England

Filed Jun. 20, 1977, Ser. No. 808,366
Claims priority, application United Kingdom, Jun. 19, 1976, 25561/76
Int. Cl.[2] A24C *5/50*
U.S. Cl. 93—77 FT 14 Claims



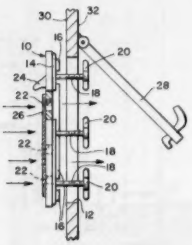
1. Apparatus for feeding wrapper material, comprising means for feeding a web of wrapper material, means for continuously longitudinally slitting the web into a number of strips, at least two endless bands, guide means defining paths for said bands and arranged so that the paths are adjacent in a first region and laterally spaced apart in a second region, said bands being arranged so that each strip is supported by a band between said first and second regions, and means for receiving laterally spaced strips from the bands in said second region.

4,103,597

COOLING VENT ATTACHMENT FOR SIDE WINDOW OF AIRCRAFT

Rudolph Williams, 26 South Rd., Parkway Gardens Greenburgh, White Plains, N.Y. 10600

Continuation of Ser. No. 650,299, Jan. 19, 1976, abandoned. This application Feb. 22, 1977, Ser. No. 770,996
Int. Cl.[2] B60H *1/24*
U.S. Cl. 98—2.12 1 Claim



1. A removeable vent for aircraft having at least one hinged window in a window opening between the outer skin and the interior wall of the aircraft comprising:

(a) a panel substantially similar in shape to said window opening;

(b) said panel being substantially larger than said window opening;

(c) the entire perimeter of said panel overlapping the outer skin of the aircraft outside said window opening;

(d) a resilient gasket on the overlap area of said entire perimeter whereby a waterproof seal between said panel and the outer skin of the aircraft is achieved;

(e) a plurality of rigid frame blocks on the inside of said panel, said frame blocks being positioned to partially enter said window opening and laterally position said panel centered on said window opening;

(f) ventilating holes in said panel;

(g) insect screening on said panel at least over said ventilating holes;

(h) at least two spaced-apart threaded posts extending inward normal to said panel;

(i) said at least two spaced-apart threaded posts passing grazingly through said window opening into the interior of the aircraft;

(j) wing nuts threaded onto each of said at least two threaded posts;

(k) the wings of said wing nuts engaging the interior wall adjacent to said window opening and applying inward force on said at least two threaded posts whereby said resilient gasket is compressed between said panel and said outer skin; and

(l) a rain gutter across the top of said panel at least over the area of said panel containing said ventilating holes, said rain gutter directing rainwater downward and away from said ventilating holes.

4,103,598

WALL STRUCTURE

Kenneth R. Cooper, Don Mills, Canada, assignor to Canada Square Management Ltd., Toronto, Canada

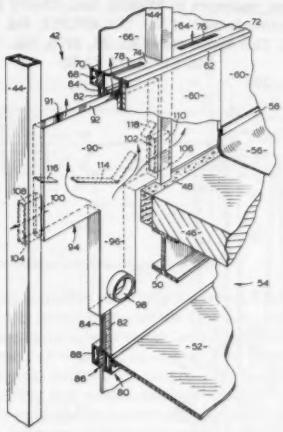
Filed Jan. 24, 1977, Ser. No. 762,075
Claims priority, application Canada, Jan. 30, 1976, 244844
Int. Cl.[2] F24F *7/00;* F24D *5/10*
U.S. Cl. 98—31 3 Claims

1. A wall structure incorporating at least one air outlet unit for a forced air circulation system;

wherein the structure includes: a plurality of spaced vertical posts defining at least two adjacent wall sections, each including: a transverse member extending between the

posts defining said section; and inner and outer wall panels co-operating with said member to define an air space between the posts; said transverse member being formed with at least one opening through which air can flow from said air space;

and wherein the air outlet unit is disposed in the said air space of one of said at le..st two adjacent sections and defines a chamber having: an air inlet adapted to be coupled to an air supply duct of said air circulation system; a first air outlet communicating with said opening of the transverse member defining the air space; and at least one additional air outlet for delivering air to the air space of said adjacent wall section, the intervening wall post being



formed with an opening permitting communication between the last-mentioned air space and said additional air outlet, so that air delivered to the outlet unit in use issues through the outlet openings in the transverse members of both of said adjacent wall sections;

and wherein the transverse member of at least one of said wall sections defines a window sill, the inner and outer wall panels of that section being disposed below the sill member;

and wherein the structure further includes a window panel above said sill member, said opening in the sill member being disposed at the inner side of the window panel, whereby air issuing through said opening in the sill member passes upwardly at the inner side of the window panel.

4,103,599

METHOD AND MEANS FOR IMPROVED AIR DISTRIBUTION

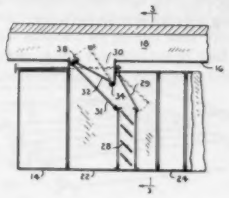
Louis Walker, Griffith, Ind., assignor to Armand Ascani, Park Forest and Louis J. Piattoni, Chicago Heights, both of, Ill., part interest to each

Continuation of Ser. No. 607,119, Aug. 25, 1975, abandoned. This application Jan. 10, 1977, Ser. No. 757,831

Int. Cl.[2] F24F *13/08*

U.S. Cl. 98—33 A **7 Claims**

4. In an air distribution system for a plurality of rooms wherein a duct line channels air from a blower source to said rooms and wherein a plurality of air control boxes are interposed between said duct line and said rooms, and wherein each of said air control boxes having an opening to communicate said duct line and at least one of said plurality of rooms, wherein means operate a damper in said opening of said control box to control air flow through said air control box from said duct line to said rooms, and further wherein a return plenum opening is provided for each of said air control boxes communicating said air control boxes and said blower source for recirculating the air when said damper in said opening of said control box is closed, the improvement therewith comprising: a pivoted closure means in each of said return plenum openings having counterweight means and weighted to progressively close each of said return plenum openings as said



damper in said opening of said control box progressively opens, and to progressively open said return plenum opening as said damper progressively closes said opening in said control box.

4,103,600

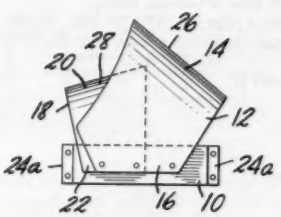
CHIMNEY CAP

John Gardiner Bridge, R.D. 1, Chestnut Ridge, Glens Falls, N.Y. 12801

Filed May 18, 1977, Ser. No. 798,249

Int. Cl.[2] F23L *17/02*

U.S. Cl. 98—66 R **3 Claims**



1. A chimney cap for diverting rain and downdrafts with minimal restriction to the escape of gases from the chimney, comprising:

a generally horizontally disposed open base for attachment to a chimney; and

two arch-like members of sheet material, each having a central portion and two opposite leg portions, one arch-like member being larger than the other, the opposite leg portions of both arch-like members being attached in overlapping relation to the same opposite sides of the base such that the crowns of said central portions are inclined to the horizontal in opposite directions so as to slant downward from the center of the cap towards opposite ones of the two remaining sides of the base, the larger arch-like member overlapping the smaller arch-like member near the center of the cap and defining a clearance therebetween for escape of chimney gases, the arch-like members also overlapping and defining clearances with said opposite ones of the remaining sides of the base.

4,103,601

AIR GRILLE COMPONENTS AND AIR GRILLE THEREFROM

Lloyd Giddis Dayus, 3400 Riverspray Dr., Mississauga, Canada

Filed Oct. 22, 1976, Ser. No. 734,956

Int. Cl.[2] F24F *13/00*

U.S. Cl. 98—110 **20 Claims**

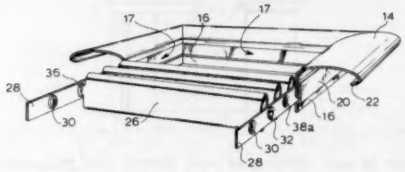
1. A frame member for use in the construction of a frame for an air grille, said frame member comprising;

a facing flange adapted to provide a border for said air grille, and having inner and outer edges;

a frame wall extending along said inner edge at an angle relative to said flange for supporting said air grille;

recessed channel means formed along said frame wall;

an inturned portion on said outer edge of said facing flange and defining a groove therebetween;



four rectangular L-shaped joining members, at the four corners of said frame, said joining members fitting in said groove, and,

tooth means on said joining members engaging at least one of said flange and inturned portion.

4,103,602

AUTOMATIC HYDRAULIC MACHINE FOR PREPARING INFUSIONS, IN PARTICULAR OF COFFEE

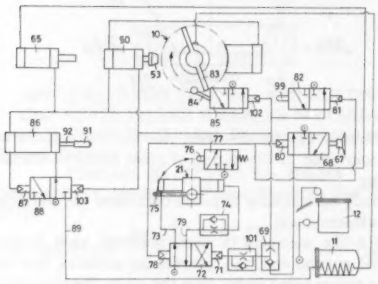
Marco Oggioni, Via Tritone 12, and Vinicio Rastrelli, Via A. Volta 27/22, both of Genova, Italy

Filed May 10, 1977, Ser. No. 795,548

Claims priority, application Italy, May 28, 1976, 23778 A/76

Int. Cl.[2] A47J *31/34*

U.S. Cl. 99—289 D **6 Claims**



1. An automatic machine for preparing infusions, in particular of coffee, comprising in combination an infusion unit including a casing (**13**) with four apertures (**45**, **46**, **47**, **48**) disposed at 90° one to another, a heat insulatable infusion cylinder (**14**) with two opposing chambers (**28**, **29**) means for feeding said opposing chambers alternately with a predetermined measure of hot water under pressure from a boiler (**11**) fed by a hydraulic dispensing cylinder (**86**);

two hydraulic pistons (**30**, **31**) carrying a filter (**42**), mobile respectively in said chambers (**28**, **29**) and interconnected by a central rod (**32**) slidable in an intermediate chamber (**33**) to which the hot infusion water is fed, and is then fed through passages (**37**, **38**) alternately into the chambers (**28**, **29**) respectively, and then through the filter (**42**) via bores (**44**);

a hydraulic motor (**21**) rotating said infusion cylinder (**14**) stepwise so that its two chambers (**28**, **29**) become successively aligned with the four apertures (**45**, **46**, **47**, **48**);

at the apertures (**45**, **46**) there are located two respective opposing hydraulic pistons (**51**, **56**) for pressing one of the two filter-carrying pistons (**30**, **31**) against a counterfilter (**57**) there is clamped a predetermined does of coffee powder previously fed through the aperture (**47**), said dose being traversed by the hot water required for preparing the infusion which is delivered through a duct (**58**) partly provided in the piston (**56**), the used coffee cake being discharged downstream through the aperture (**48**) by a nozzle also fed with high pressure water; and

an assembly of suitably interconnected hydraulic components arranged to control and program all the various stages of the cycle.

4,103,603

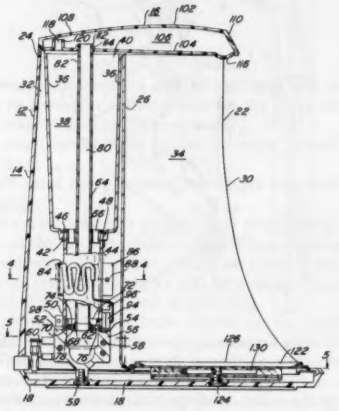
AUTOMATIC COFFEE BREWING DEVICE

Karl H. Bergmann, Cherry Hill, N.J., and Harvey Levine, Fairfield, Conn., assignors to Melitta, Inc., Cherry Hill, N.J.

Continuation-in-part of Ser. No. 490,063, Jul. 19, 1974, abandoned. This application Oct. 31, 1975, Ser. No. 627,476

Int. Cl.[2] A47J *31/00*

U.S. Cl. 99—294 **7 Claims**



1. An automatic coffee brewing device comprising a structure having a cavity therein providing a reservoir for receiving water, a water heating and pumping means positioned under the reservoir, an elongated tubular connecting means extending vertically between said reservoir and said heating and pumping means having a top end secured with the bottom of the reservoir and a bottom end secured to the top of said heating and pumping means for delivering water from the reservoir to the heating and pumping means, said pumping means including a valve for receiving water from said connecting means and a riser tube for receiving heated water from said heating and pumping means having a bottom end secured with said valve and extending upwardly and centrally through said connecting means and vertically through said reservoir, said tube being heat conductive for transferring heat from the fluids pumped therethrough to the water in said connecting means and reservoir, and water dispensing means receiving and dispensing externally the fluids being pumped through the riser tube, the connecting means having a water containing capacity greater than that of the heating and pumping means and a reduced water containing capacity with respect to that of the reservoir for causing a higher temperature rise for water contained therein with respect to the water contained in the reservoir, said structure having an opening at its top communicating with its reservoir for receiving water therethrough to fill said reservoir, and including a cover member received over and enclosing the top opening of said structure, said cover member including said dispensing means and having bottom and top walls enclosing a chamber therein, said cover member having a first opening over the reservoir of said structure for removably receiving therethrough the top end of the riser tube of said pump, the bottom wall of said cover member having a second

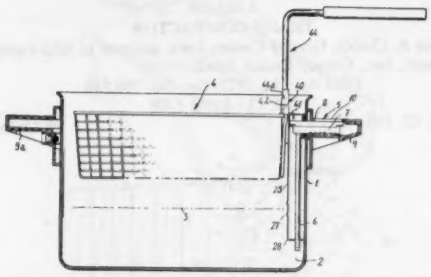
opening for providing a water dispensing spout, and a third opening over the reservoir of said structure for venting and returning heated fluid to said reservoir.

4,103,604

COOKING CONTAINER, ESPECIALLY FOR FRYING FOOD PRODUCTS

Jean Claude Berard, Saint Chamond, France, assignor to SEB S.A., Selongey, France

Filed Jun. 22, 1976, Ser. No. 698,717
Claims priority, application France, Feb. 24, 1976, 76 05068
Int. Cl.[2] A47J *37/12*
U.S. Cl. 99—342 **6 Claims**



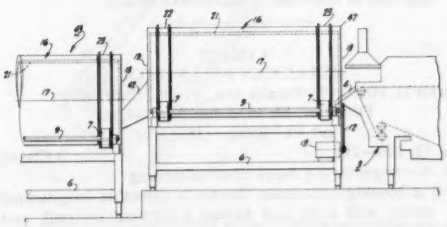
1. A cooking container especially for frying food comprising a vessel which is intended to contain a cooking bath and to be placed on a heat source, said vessel has a handle and comprises a thermometer probe extending within said vessel and fitted with a reading dial which is inserted in a visible manner in said handle for holding said vessel, said probe comprising a casing which is flush-mounted in a removable manner within a recess of the handle, a temperature-sensitive stem extending from said casing and located inside the vessel along a lateral wall of said vessel, said casing passing through a passage formed in the vessel wall, sealing means sealing said casing in a leak-tight manner in said passage, a seal within the interior of the vessel surrounding said passage, a cover plate covering said seal within the interior of the vessel, the seal having a flexible lip which is adapted to the contours of the casing, and at least one fixing screw by which the cover plate is attached to the handle.

4,103,605

MEATBALL COOKER

Göeran Hemborg, Aengelholm; Winje Green, Helsingborg, both of Sweden; Nils Lang-ree, Los Altos, and Edward D. Baker, San Francisco, both of Calif., assignors to N.P.I. Corporation, Burlingame, Calif.

Filed Jan. 17, 1977, Ser. No. 760,162
Int. Cl.[2] A47J *37/00*
U.S. Cl. 99—345 **4 Claims**



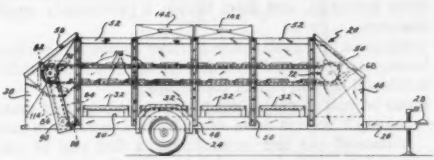
1. A meatball cooker comprising a frame, an open-ended drum having a solid inner wall concentric with an axis and having an axial inlet opening to the atmosphere at one end and an axial outlet opening to the atmosphere at the other end, means for mounting said drum on said frame for rotation about said axis in substantially a horizontal position, an outer wall on said drum and with said inner wall defining a jacket, means for supplying said jacket with heating fluid, means for releasing heating fluid from said jacket, means for supplying meatballs through said inlet opening to said drum, means for supplying cooking oil through said inlet opening to said drum, helical fins on said inner wall adapted to propel said meatballs and said cooking oil together along the bottom of said inner wall and through said drum from said inlet opening to and through said outlet opening.

4,103,606

COOKING DEVICE

Theodore N. Gitcho, Pana, Ill., assignor to Mr. Drumstick, Inc., Pana, Ill.

Filed Apr. 22, 1977, Ser. No. 789,858
Int. Cl.[2] A23L *3/00*; A47J *31/04, 37/10*
U.S. Cl. 99—443 C **19 Claims**



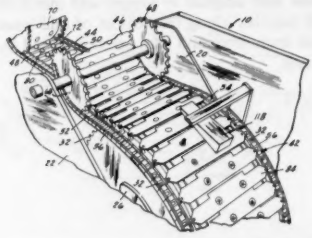
1. A cooking device comprising an elongated housing having spaced opposite side and end walls and a closure wall extending therebetween, means for supporting fuel located in the housing near the bottom thereof, sprocket means mounted for rotation in the housing at spaced locations between the opposite ends thereof, a pair of continuous flexible drive members mounted in opposed relationship to each other in the housing, each of said drive members being engageable with the spaced sprocket means located in said housing and having reaches which extend therebetween, means for connecting the drive members at spaced corresponding locations therealong including a plurality of rod members attached therebetween, spaced and opposed means pivotally supported on selected ones of said rod members, a plurality of rack members for holding food products to be cooked, each of said rack members having spaced end walls with aligned means for engaging the spaced and opposed means on a selected one of the selected rod members, means for supporting the rack members in a first position during movement in one direction in the housing between the spaced sprocket means, means for supporting the rack members in a different position during movement in the opposite direction in the housing, means operatively engageable with the sprocket means for rotation thereof, and means providing access into the housing for enabling attaching the rack members to and detaching the rack members from the means on the rod members, the spaced and opposed means pivotally supported on selected ones of said rod members including a pair of hook-like members mounted thereon, said hook-like members of each pair having portions that extend toward each other, and means biasing at least one of the hook-like members on each of the selected rod members toward the opposed hook-like member thereon.

4,103,607

PITTING DEVICE FOR DRUPACEOUS FRUIT

Clarence M. Hansen, East Lansing; John P. Harvey, Grand Haven, and Richard L. Ledebuhr, Haslett, all of Mich., assignors to Dura Corporation, Southfield, Mich.

Filed Aug. 30, 1976, Ser. No. 718,467
Int. Cl.[2] A23N *4/06, 3/04;* A47J *23/00*
U.S. Cl. 99—548 **2 Claims**



2. Conveying and pitting apparatus for continuous, high volume processing of pieces of drupaceous fruit comprising,

apparatus body having two spaced uprights and an L-shaped outer support portion rotatively carried by said uprights to allow said outer portion to be swung upward and away from said uprights and provide separation therebetween,

a drive wheel rotatively carried between said uprights and having a pair of spaced inner conveyor portion drive sprockets and a pair of spaced outer conveyor portion drive sprockets, said pairs having a proximately equal diameter,

a continuous, triangular-shaped inner conveyor portion having one substantially vertical leg and one substantially horizontal leg and further comprising,

a pair of spaced chains positioned to engage said inner conveyor portion drive sprockets at a junction of said horizontal and said vertical legs, a first pair of idle sprockets positioned at an outer end of said horizontal leg, and second pair of idle sprockets positioned at a bottom of said vertical leg,

a plurality of crossbars carried between alternate links of said spaced chains, said crossbar having legs carried one each at ends of said crossbars and pivotably joined to said links to form an inner offset, and

a plurality of fruit receiving cups carried on an outer surface of said crossbar, said cups having a semi-spherical inner surface and an aperture through said cup,

a continuous L-shaped outer conveyor portion having a first pair of substantially horizontal legs and second pair of substantially vertical legs and further comprising,

a pair of spaced chains positioned to engage said outer conveyor portion drive sprockets at a junction of said vertical and horizontal legs, a first pair of idle sprockets positioned at an outer end of said pairs of horizontal legs and above said horizontal leg of said inner conveyor portion of a proximate midpoint thereof, and a second pair of idle sprockets positioned at a bottom of said pairs of said vertical legs and aligning with said second pair of idle sprockets of said inner conveyor portion,

a plurality of crossbars carried between alternate links of said spaced chains, said crossbar having legs carried one each at ends of said crossbars and pivotably joined to said links to form an outer offset, and

a plurality of fruit covering cups carried on an inner surface of said crossbar having a semi-spherical-shaped inner surface and a flat resilient perforated diaphragm in part covering an aperture through said cup, said cups positioned to align and mate with said cups of said inner conveyor portion to form a fruit closure,

fruit depositing means to feed articles of fruit into said fruit receiving cups of said inner conveyor portion, said means positioned between said ends of said horizontal legs of said inner and outer conveyor portions, said pair of spaced chains of said inner conveyor portion engaging said depositing means and driving such at a synchronized speed,

cam means carried on said apparatus body

pitting means carried by said drive wheel between said pairs of sprockets and actuable by said cam means to selectively reciprocate into said aperture in said cups of said inner and outer conveyor portions as said spaced chains of said inner and outer conveyor portions engage with said pairs of drive sprockets respectively,

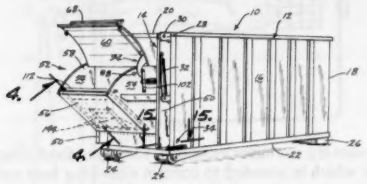
wherein pitting can be accomplished continuously in that there is no relative longitudinal motion between said pitting means and said fruit closure.

4,103,608

TRASH COMPACTOR

Louis A. Chenot, Grundy Center, Iowa, assignor to Mid-Equipment, Inc., Grundy Center, Iowa

Filed Apr. 21, 1977, Ser. No. 789,348
Int. Cl.[2] B30B *1/08*
U.S. Cl. 100—53 **19 Claims**



1. A compactor comprising:

a container having side walls, top and bottom walls and an end wall;

a compactor blade pivotally mounted adjacent one end of said container for pivotal movement about a horizontal axis from an initial position to a compacting position;

a stationary frame mounted in fixed relation to said container;

a linkage mechanism interconnecting said stationary frame and said compactor blade;

said linkage mechanism comprising a frame link hinged to said stationary frame, a primary link hinged to said frame link, and a blade link pivotally connected to said primary link and also pivotally connected to said blade at a point spaced from said horizontal pivotal axis of said blade;

longitudinally extensible power means;

means connecting said power means to said linkage mechanism whereby said power means upon actuation causes movement of said compactor blade from said initial position to said compacting position; and

coacting stop means on said frame link, primary link and blade link, said stop means on said primary link engageable with said stop means on said frame link and blade link for pivotal movement of the engaged links in unison in response to actuation of said power means.

4,103,609

METAL CAN PELLETIZER

Martin H. Hiatt, 993 Vernon Ave., Venice, Calif. 90291

Filed Dec. 13, 1976, Ser. No. 749,887
Int. Cl.[2] B30B *1/18, 15/32*
U.S. Cl. 100—218 **3 Claims**

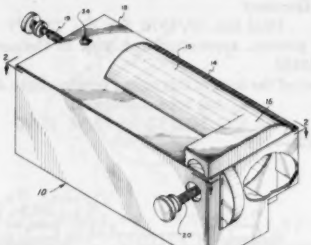
1. A compactor for metal cans comprising

(a) a housing containing therein a closeable longitudinal cavity with a lid and having a forward endwall, said cavity opening at the opposite end into a cavity extension, said longitudinal cavity and cavity extension being adapted to receive a metal can,

(b) a power driven primary ram in the longituindal cavity, a primary driving rod and primary power means wherein

the primary driving rod interconnects the primary ram with the primary power means, said driving rod passing through the forward endwall of the housing portion of said longitudinal cavity, said ram having the diameter the same as the diameter of the longitudinal cavity and wherein said power means is adapted to drive the primary ram a predetermined distance to the opposite end of the longitudinal cavity,

(c) said transverse extension forming an extension of the longitudinal cavity being substantially rectangular in shape having an endwall, a rectangular sidewall, and opposing endwall, and floor which is partially open,



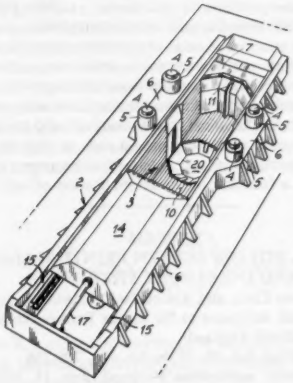
(d) a power driven transverse ram in the cavity extension at right angles to the primary ram, a transverse driving rod and transverse power means wherein the transverse driving rod interconnects the transverse ram with the transverse power means said driving rod passing through the endwall of said cavity extension and wherein said transverse power means is adapted to drive the transverse ram a predetermined distance across the cavity extension and means to reverse the direction of the primary ram and transverse ram.

4,103,610

METAL SCRAP COMPACTING PRESS

Luciano Vezzani, Corso Italia, 43, Ovada, Alessandria, Italy

Filed Nov. 22, 1976, Ser. No. 744,213
Int. Cl.[2] B30B *7/04*
U.S. Cl. 100—232 **3 Claims**



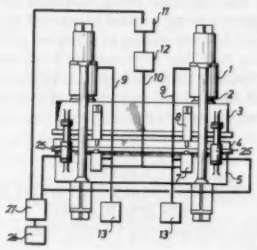
1. A scrap metal compacting press, comprising a supporting bed, a chamber formed in said bed, said chamber having a bottom surface and being open at the top for the introduction of scraps thereinto, a closing cover for said chamber, means for locking said cover in its closed position, movable walls and stationary walls defining the sides of said chamber and associated with said bed, control and guide means for the shifting movement of said movable walls operative to bring the movable walls closer to each other until there is defined therebetween a cavity wherein the distances between said walls are smaller and proximate the distances between the inner walls of a furnace whereinto the compacted scraps are to be molten, a ram having an active face defining the base of said cavity, and means for moving said ram in said bed to and away from said cover in order to press, against said cover, the scraps already compacted in said cavity, wherein said active face of said ram has a cup-like configuration including a bottom and lateral walls surrounding said bottom and projecting towards said cavity, said ram being movable between a rest position in which said bottom lies at a level below said bottom surface of said chamber and a number of operative positions in which said bottom lies above said bottom surface of said chamber.

4,103,611

STROKE-LIMITING ARRANGEMENT IN A MULTI-CYLINDER HYDRAULIC PRESS

Bengt-Johan Carlsson, Motala, Sweden, assignor to A B Motala Verkstad, Motala, Sweden

Continuation-in-part of Ser. No. 659,788, Feb. 20, 1976, abandoned. This application Sep. 14, 1977, Ser. No. 833,035
Claims priority, application Sweden, Feb. 28, 1975, 7502302
Int. Cl.[2] B30B *15/16*
U.S. Cl. 100—257 **6 Claims**



1. In a single or multi-opening, multi-cylinder hydraulic press for pressing of resilient material between two operating press surfaces, an arrangement for maintaining the relative spacing of the press surfaces at a predetermined value greater than the minimum value of said spacing during the pressing operation, and characterized by further comprising for each press cylinder (1) or each group of press cylinders, liquid supplying means (13) and, a liquid discharge valve (7) and actuating means (8) operably positioned in association with the press surfaces for mechanically opening the valve as, within the operating range of the cylinder, the relative spacing of said operating press surfaces decreases below a predetermined value, and, for each press cylinder (1) or for a plurality of cylinders in common, a valve (12) adapted to prevent or allow liquid to be discharged from the cylinder or cylinders (1).

4,103,612

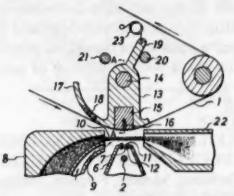
INK MIST TYPE HIGH SPEED PRINTER

Akinori Watanabe; Matsusaburo Noguchi, and Toshimichi Ota, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1977, Ser. No. 778,477
Claims priority, application Japan, Mar. 25, 1976, 51-31948
Int. Cl.[2] B41J *3/12, 3/18*
U.S. Cl. 101—1 **6 Claims**

1. An ink mist type high speed printer comprising a first electrode and a second electrode between which a high voltage is applied, an aperture board disposed between said first and second electrodes and adapted to selectively control passage of ions generated from the second electrode, a back bar

containing said first electrode, said back bar being in opposed relation to said aperture board, and means for generating a stream of ink mist between said aperture board and said first electrode, wherein the ink mist particles are selectively charged by the ions which have passed said aperture board and the electrically charged ink mist particles are attracted by the first electrode to print desired characters on a recording paper placed on said first electrode, and further characterized in that said back bar and said contained first electrode are divided along their lengths into plural segments so that the respective back bar segments and their respective contained first elec-



trode segments may be separated and moved individually away from the aperture board, and a shaft extending across said printer upon which are rotatably mounted said back bar segments, each of said back bar segments comprising an insulator spaced apart from said contained first electrode segment, each of said back bar segments being rotatable on said shaft, said back bar segments being rotated to present said first electrode having a length corresponding to a desired printing width, said next adjoining back bar segments on both sides of the outer ones of said rotated back bar segments presenting said insulator, such that an insulator is located on both sides of said rotated back bar segments adjoining said first electrode.

4,103,613

SCREEN PRINTING MACHINE WITH INK SUPPLY RECIPROCATION

Mathias Mitter, Falkenstrasse 57, 4815 Schloss Holte, Fed. Rep. of Germany

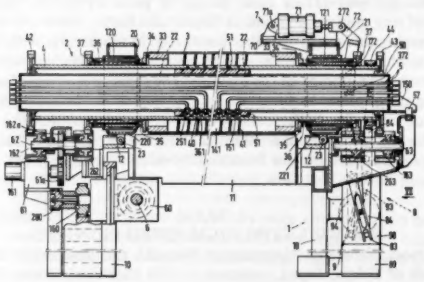
Filed Sep. 27, 1976, Ser. No. 726,876

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1975, 2543394

The portion of the term of this patent subsequent to Aug. 1, 1995, has been disclaimed.

Int. Cl.[2] B41F *15/40*

U.S. Cl. 101—115 **27 Claims**



1. In a screen printing machine, a combination comprising workpiece supporting means having a surface; an endless printing screen of substantially annular configuration, said screen having an inner screen surface a portion of which is juxtaposed with said surface of said workpiece supporting means; drive means for advancing said screen in an endless path; an elongated carrier extending axially through said substantially annular printing screen and defining an annular clearance with said inner screen surface thereof; partition means provided on and extending from said carrier across said clearance to at least said portion of said screen surface and partitioning said annular clearance into at least two axial chambers; means for admitting printing medium into each of said chambers; and means for displacing said carrier and partition means in said annular clearance relative to said screen in at least one of the axial and circumferential directions of said annular clearance.

4,103,614

SCREEN PRINTING MACHINE WITH RECIPROCATING ENDLESS PRINTING SCREEN

Mathias Mitter, Geschaftsfuhrer Falkenstrasse 57, 4815 Schloss Holte, Germany

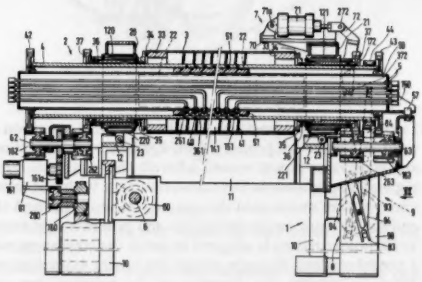
Filed Sep. 27, 1976, Ser. No. 726,877

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1975, 2543419

The portion of the term of this patent subsequent to Aug. 1, 1995, has been disclaimed.

Int. Cl.[2] B41F *15/10, 15/38, 15/40*

U.S. Cl. 101—115 **33 Claims**



1. In a screen printing machine, a combination comprising an endless printing screen having an outer surface and a corresponding inner surface; means mounting said printing screen for advancement in a printing path in which successive portions of said outer surface become juxtaposed with a web travelling past said outer surface so as to print patterns onto said web; an elongated carrier extending through the space surrounded by said screen transversely of the path of travel of said web and defining with said inner surface an annular clearance; at least one partition on said carrier, extending across said clearance at least opposite said web and subdividing said clearance into two successive axial chambers; means for admitting flowable printing medium via said carrier into said chambers from where the printing medium passes through the screen so as to print on said web; and means for continuously reciprocating said screen in direction transversely of said printing path while said screen is advancing in said path, so that the location of successive patterns printed onto said web varies transversely of the web as a function of the reciprocation of said screen.

4,103,615

VERTICAL ROTARY SCREEN PRINTING MACHINE AND INK SUPPLY THEREFORE

Edmundo Novas Cruz, and Alvaro Neff Valadares, both of Lisbon, Portugal, assignors to Sir James Farmer Norton & Co., Limited, Salford, England

Filed Jul. 29, 1976, Ser. No. 709,736

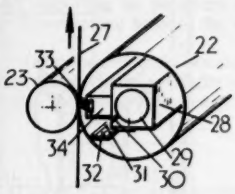
Claims priority, application Portugal, Jan. 14, 1976, 64693; United Kingdom, May 25, 1976, 21574/76

Int. Cl.[2] B41F *15/44*

U.S. Cl. 101—120 **12 Claims**

1. A rotary screen printing machine comprising; a frame including a plurality of screen printing cylinders, means for superimposing said printing cylinders in a vertical arrangement one above another on said frame; a dye dispensing bar and squeegee arrangement extending through each said printing

cylinder and including a hollow bar extending therethrough and projecting beyond the ends thereof; spaced platforms for said each cylinder; a first bearing slidably mounted on one said platform and rotatably mounting one end of said hollow bar; a second bearing slidably mounted on the other said platform and mounting the other end of the hollow bar; a squeegee blade mounted along the hollow bar for contact with the internal surface of the corresponding printing cylinder; a plate supported along the hollow bar to define with the squeegee blade a dye liquor weir in communication with the hollow bar interior via metering passage means; means connected to one of said ends of the hollow bar for controllably feeding dye



liquor into the hollow bar interior and from thence via said metering passage means and weir to the printing cylinder internal surface; means on each said platform and connected to each bearing for sliding the latter along the platforms radially towards or away from the internal surface of its corresponding printing cylinder to vary the contact pressure between the squeegee blade and each said printing cylinder and adjustment means interconnecting the second bearing and the hollow bar for pivoting the hollow bar about its own axis and locking the same in adjusted angular position to thereby control the amount of dye liquor egressing from the weir radially towards the corresponding printing cylinder internal surface.

4,103,616

ELASTOMERS AND IMPROVED WATERLESS LITHOGRAPHIC PRINTING MASTERS

Joseph Y. Chu, Fairport, and Richard L. Schank, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

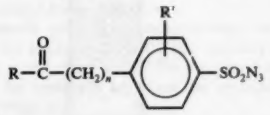
Filed Apr. 27, 1977, Ser. No. 791,354
Int. Cl.[2] B05D *3/06*
U.S. Cl. 101—467 **8 Claims**

1. A process for preparing an imaged waterless lithographic printing master comprising

(a) providing a suitable master substrate,

(b) providing a silicone elastomer gum having pendant reactive hydroxyl or primary or secondary amino groups,

(c) providing an azide which is thermally stable at ambient temperature in an amount sufficient to react with said pendant groups wherein said azide is of the formula



wherein R is chloro or hydroxyl, R' is chloro, cyano, hydrogen or nitro or an alkyl of from 1–8 carbon atoms and *n* is an integer of from 0–20,

(d) reacting said azide with said pendant groups and coating said substrate with the reaction product,

(e) depositing a particulate image pattern comprising a thermoplastic hydrocarbon polymer on said coating in image configuration, and

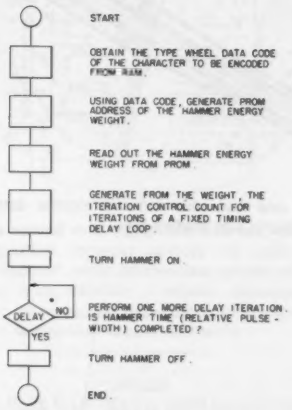
(f) crosslinking said silicone to chemically bond said hydrocarbon polymer thereto and the silicone to the substrate.

4,103,617

HAMMER ENERGY IMPACT CONTROL USING READ ONLY MEMORY

William L. O'Brien, Waterloo, and Wayne M. Doran, Kitchener, both of Canada, assignors to NCR Canada Ltd. - NCR Canada Ltee, Mississauga, Canada

Filed Jan. 10, 1977, Ser. No. 758,220
Int. Cl.[2] B41J *7/92*
U.S. Cl. 101—93.03 **9 Claims**


START
OBTAIN THE TYPE WHEEL DATA CODE OF THE CHARACTER TO BE ENCODED FROM RAM.
USING DATA CODE, GENERATE PROM ADDRESS OF THE HAMMER ENERGY WEIGHT.
READ OUT THE HAMMER ENERGY WEIGHT FROM PROM.
GENERATE FROM THE WEIGHT, THE ITERATION CONTROL COUNT FOR ITERATIONS OF A FIXED TIMING DELAY LOOP.
TURN HAMMER ON.
DELAY
NO
PERFORM ONE MORE DELAY ITERATION. IS HAMMER TIME (RELATIVE PULSE - WIDTH) COMPLETED ?
YES
TURN HAMMER OFF.
END.

1. In a printer having movable means for carrying type characters, hammer means for impacting against the type characters, and means for controlling the impact energy of said hammer means, said impact energy controlling means including first memory means containing coded data of the position of said type characters on said movable means,

second memory means containing coded data representative of the surface areas of the respective type characters;

computer means for selecting coded data from said second memory means as defined by the type character being printed, and

means for energizing said hammer means for a duration comprising the sum of a fixed period of time and of an additional period of time representative of the coded data selected by said computer means.

4,103,618

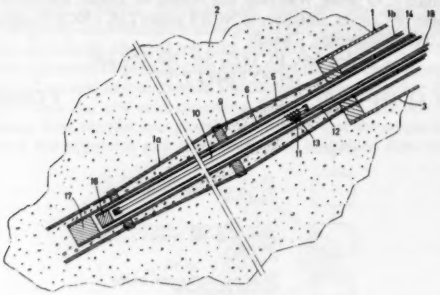
MEANS FOR EXTRACTING A SOIL ANCHOR CONSISTING OF A PRESTRESSED STEEL TENDON

Hans Dietrich, Bolligen, Switzerland, assignor to Losinger AG, Bern, Switzerland

Division of Ser. No. 586,801, Jun. 13, 1975, Pat. No. 4,036,137. This application Jan. 19, 1977, Ser. No. 760,583
Claims priority, application Switzerland, Jun. 19, 1974, 8424/74
Int. Cl.[2] F42D *1/00*
U.S. Cl. 102—22 R **2 Claims**

1. Means for extracting a ground anchor embedded in the ground including a tendon embedded in concrete in a borehole in the ground, comprising a hollow loading tube placed longitudinally of the entire length of the tendon and an explosive means for subjecting the ground anchor to a rupturing force in the borehole so that after detonating the explosive means the ground anchor can be withdrawn from the borehole, said

explosive means comprising a charge tube having a fuse cord and an electric detonator attached to said cord, said charge



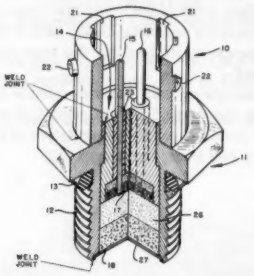
tube with said fuse cord and said electric detonator being introduceable in said loading tube.

4,103,619

ELECTROEXPLOSIVE DEVICE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Vincent J. Menichelli, Glendale, Calif.

Filed Nov. 8, 1976, Ser. No. 740,153
Int. Cl.[2] F42C *19/12*
U.S. Cl. 102—28 R **9 Claims**



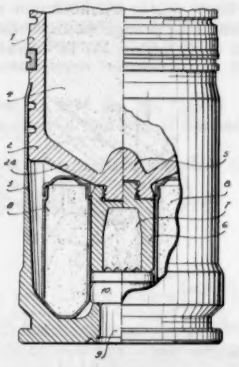
1. In an electroexplosive device, a body having a passage and a header comprised of an insert having an external configuration matching said passage through said body such that said header will lodge in said passage at said one end leaving a space in said body for explosive materials to be loaded into said body behind said header, said insert having a cavity in the end thereof over which said explosive material is loaded, said header further comprising at least two electrical contact pins passing through said insert with ends of said pins protruding from said insert at said one end of said body passage, and with the other ends of said pins in said cavity of said insert flush with the cavity-end of said insert, a first layer of nonlinear resistive composition formed in said cavity of said insert in electrical contact with both pins, a second layer of thermal conductive dielectric composition over said layer of nonlinear resistive composition, and a bridgewire connected across the ends of said pins in thermal contact with said second layer over its full length between said contact pins.

4,103,620

PROJECTILE EXPLOSIVE

Maurice Rusbach, Vernier, Geneva, Switzerland, assignor to Sarmac S.A., Carouge, Geneva, Switzerland

Filed Oct. 28, 1976, Ser. No. 736,305
Claims priority, application Switzerland, Nov. 12, 1975, 14699/75
Int. Cl.[2] F42B *13/34*
U.S. Cl. 102—38 **16 Claims**



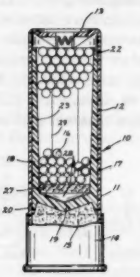
1. An explosive fragmentation type projectile stabilised by gyration, carrying a tubular case and provided with an instantaneous percussion head fuse and a tracer, in which the base of the projectile comprises a thick heavy and projecting central part, having at its rear end means of attaching a tracer and in which an annular part of the base connecting the central part to a cylindrical wall of the projectile is of a thickness which diminishes in the direction of the central part, and which extends towards the rear of the projectile, and in which this annular part of the base comprises at least one zone of diminished strength.

4,103,621

WAD COLUMN FOR SHOTSHELLS

David G. Fackler, 16230 Fifth Ave., North, Wayzata, Minn. 55391

Filed Jul. 19, 1976, Ser. No. 706,219
Int. Cl.[2] F42B *7/08*
U.S. Cl. 102—95 **2 Claims**



1. A wad column for a shotshell and a shotgun with a full choke barrel incorporating a tapered choke restriction, the wad column comprising:

a resiliently flexible molded plastic shot cup having a peripheral cup wall and a transverse bottom wall formed integrally and in one piece with the peripheral wall and extending entirely across the peripheral wall,

the peripheral wall having an outer open mouth end and an inner sealing skirt end adjacent the bottom wall, the bot-

tom wall being dome-shaped with a concave side facing the open mouth end of the peripheral wall, the bottom wall having an obliquely angular relation to the adjacent peripheral cup wall, the peripheral wall progressively increasing in thickness from the open mouth end to the bottom wall to the extent that the inner peripheral surface of the cup wall tapers conically and divergently toward the open mouth end, the peripheral cup wall having slits extending from the open mouth end substantially to the bottom wall; and

a hard cardboard wad in the cup and bearing against the entire periphery of the dome-shaped bottom wall and cooperating therewith to define an air chamber, and the bottom wall supporting the periphery of the wad and facilitates efficient sealing between the wad and bottom wall, and

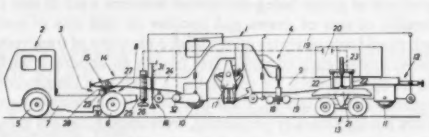
the cardboard wad deforming under pressure of rapid acceleration in the shotgun barrel to at least partially collapse the air chamber and reduce pressures upon the shot in the cup.

4,103,622

BALLAST TAMPING MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen m.b.H., Vienna, Austria

Filed May 12, 1977, Ser. No. 796,373
Claims priority, application Austria, Sep. 10, 1976, 6746/76
Int. Cl.[2] E01B *27/17*; B61F *13/00*
U.S. Cl. 104—7 R **8 Claims**



1. A machine for tamping ballast under the ties of a track and adapted for selective movement on a road or on the track, comprising

(a) a machine frame having two ends,

(b) an undercarriage at each of the machine frame ends, whereon the machine frame is mounted, the undercarriages having wheels adapted for engagement with, and mobility on, the track,

(c) a truck tractor and undercarriages supporting the truck tractor, the undercarriages of the truck tractor having wheels adapted for engagement with, and mobility on, the road,

(d) coupling means for coupling one of the machine frame ends to the truck tractor,

(e) a vertically adjustable lifting and support means for the machine frame,

(f) a ballast tamping unit mounted on the machine frame between the coupling means and the undercarriage at the other machine frame end,

(g) a vertically adjustable undercarriage having wheels adapted for engagement with, and mobility on, the road mounted at the other end of the machine frame,

(h) a drive for vertically adjusting the vertically adjustable undercarriage, and

(i) a drive for moving the machine.

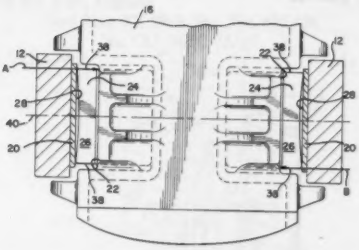
4,103,623

SQUARING FRICTIONALLY SNUBBED RAILWAY CAR TRUCK

Robert P. Radwill, Oak Lawn, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Dec. 23, 1976, Ser. No. 753,790
Int. Cl.[2] B61F *5/06, 5/12, 5/24, 5/50*
U.S. Cl. 105—197 DB **9 Claims**

1. A truck squaring apparatus for a railway car truck comprising: a side frame having a column a relatively vertically movable bolster supported adjacent thereto; a friction surface on said column; a friction shoe pocket having a guiding surface on said bolster a friction shoe disposed in said pocket and having a first wall engageable with said friction surface on said



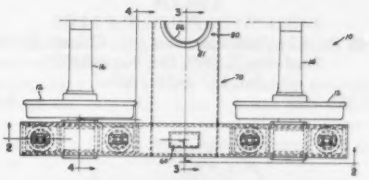
column and a second wall engageable with said guiding surface; said respective engaging surfaces and walls having a transversely disposed recess intermediate spaced ends thereof and extending in the direction of relative movement so that initial contact between said engaging surfaces and walls is made adjacent said spaced ends of said walls.

4,103,624

RAILWAY CAR TRUCK SIDE BEARINGS

James C. Hammonds, and Jan D. Holt, both of St. Charles, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Division of Ser. No. 519,976, Nov. 1, 1974, Pat. No. 4,082,043, which is a continuation-in-part of Ser. No. 447,823, Mar. 4, 1974, abandoned. This application Nov. 26, 1976, Ser. No. 745,315
Int. Cl.[2] B61F *5/14*; C10M *5/00, 7/00*; F16C *33/24*
U.S. Cl. 105—199 CB **2 Claims**



1. A railway car truck assembly comprising: an integral H frame including spaced apart, longitudinally extending side frames integrally joined by means of a transversely extending transverse member having a center fearing;

a pair of transversely extending axles journalled in journal boxes respectively on opposite sides of the truck; said axles having four wheels integral therewith for movement along a railway car track;

said side frames being resiliently mounted for rocking movement on said journal boxes;

said side frames each having mounted thereon at about the midpoint thereof at least one constant contact side bearing adapted to take the weight of said car body; said side bearing having an upper surface made of a first low friction material;

a car body above said truck to pivot about said center bearing including a depending portion having a lower surface made of a second low friction material supported on said side bearings;

one of said first and second low friction material comprising filled nylon and the other of said first and second low friction materials comprising filled polytetrafluoroethylene; said first and second low friction materials having a coefficient of friction sufficiently low to allow relative rotation between the truck and the car body.

4,103,625

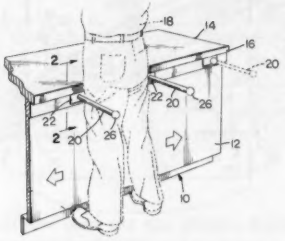
SUPPORTING OR STABILIZING DEVICE

Robert B. Black, 5110 Berkley Ct., Fort Wayne, Ind. 46815

Continuation of Ser. No. 606,535, Aug. 21, 1975, abandoned. This application Feb. 22, 1977, Ser. No. 770,682

Int. Cl.[2] A61G *13/00*; A47B *37/00*

U.S. Cl. 108—44 **8 Claims**



1. In combination with a work table having a planar surface and a front edge and mounted within a vehicle, said vehicle having a floor located in front of said table, a support and stabilizing apparatus comprising: a horizontal elongate support element telescopically received in said table and extensible out of said table beyond said front edge in a direction generally parallel to said planar surface, said support element being spaced above the vehicle floor at a level which would be above the knees of a person standing in front of said table whereby the person can brace his body against said element, means for preventing movement of said element in a lateral direction with respect to the longitudinal axis thereof, and retaining means engaging said element for releasably retaining said element in its extended body bracing position.

4,103,626

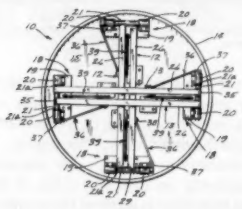
TABLE WITH FOLDABLE LEGS

Arthur G. Barricks, 7605 Vincennes Ave., Chicago, Ill. 60620

Filed Nov. 7, 1977, Ser. No. 848,879

Int. Cl.[2] A47B *3/00*

U.S. Cl. 108—127 **5 Claims**



1. A table having a table top and two pairs of legs foldable into planes parallel with the table top whereby one leg of each pair is parallel to the other leg of such pair, said table comprising:

(a) means having pivot shaft portions for mounting each of said legs to the underside of said table top near the periphery thereof, with opposite end portions of each pair of associated legs fixed to an associated pivot shaft portion for independent movement of the legs to folded and unfolded positions therefor, and

(b) the legs of one of said pairs of legs having the longitudinal axes thereof in a plane common to the longitudinal axes of said associated pivot shaft portions when in the folded positions therefor, and the legs of the other of said pairs of the legs having the longitudinal axes thereof in a plane laterally offset from the plane of the longitudinal axes of the associated shaft portions therefor when in folded positions so as to be beneath and abut against the legs of said one pair when both pairs of legs are in the folded positions therefor.

4,103,627

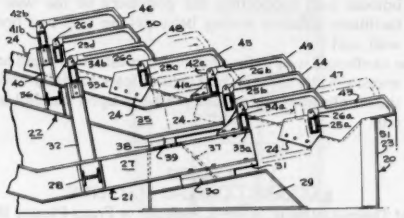
STOKER AND GRATE THEREFORE

Christian M. Mainka, Bayside, N.Y., assignor to Morse Boulger, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 610,439, Sep. 4, 1975, abandoned. This application Mar. 22, 1977, Ser. No. 779,988

Int. Cl.[2] F23B *1/22*; F23C *7/00*

U.S. Cl. 110—281 **30 Claims**



1. A stoker comprising a support frame, a first plurality of longitudinally spaced sets of grates mounted on said support frame, a second plurality of longitudinally spaced sets of grates mounted on said support frame, each set of said second plurality of sets of grates being interposed between a set of said first plurality of sets of grates and another of said sets of grates, each of said sets of grates comprising a plurality of transversely spaced grates, each of said grates having an underside surface and an upper surface for supporting a grate of a longitudinally successive set of grates, each transversely successive pair of grates having laterally projecting, overlapping flanges providing a tortuous air passage between said successive pair of grates, at least one of said flanges terminating at a point disposed in spaced relation to said underside surface of said grate to provide a substantially longitudinal air passageway between transversely successive grates, and means for reciprocating said second plurality of sets of grates relative to said first plurality of sets of grates.

4,103,628

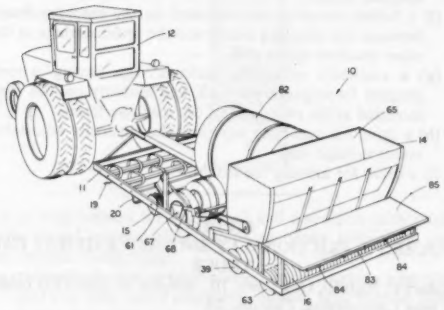
CONDITIONER DRILL

Charles O. Gaston, R.R. 2, Box 18, Cloverdale, Ind. 46120

Filed Sep. 7, 1976, Ser. No. 721,165

Int. Cl.[2] A01C *5/00*

U.S. Cl. 111—52 **2 Claims**



1. In a conditioner drill having a frame and means for moving the frame relative the ground, and including first and second compressor roll devices and a planter mounted upon the

frame, the frame having a front half portion and a back half portion, the first compressor roll device being mounted upon the frame in front of the planter, the improvement comprising:

a first plurality of plow teeth mounted upon the frame in front of the first compressor roll device; and

the planter being located on the frame between the first and second compressor roll devices, and having means whereby seed deposited by the planter as the frame is moved relative the ground is located at a uniform depth in the ground, said means including said first compressor roll device located in said front half portion whereas said second compressor roll device and said seed drill are located in the back end of said back half portion, said first and second compressor roll devices cooperatively supporting said frame above ground;

said planter located on said frame having a plurality of ground engaging extensions to form furrows into which seed is planted;

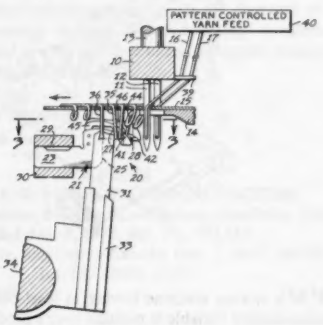
drive means mounted on said frame between said first compressor roll device and said planter and including a drive wheel pivotally mounted upon said frame and positioned to engage ground over which the frame is moved and being connected to said planter to cause the planter to deposit seed into the ground at an even rate per unit area regardless of the speed of said frame over the ground, said drive means including means connected to said drive wheel operable to force said drive wheel to extend at an elevation different than said compressor roll devices to continuously contact ground in the event a ground ridge is present between the compressor roll devices and beneath said drive wheel.

4,103,629

LOOPER APPARATUS FOR FORMING CUT PILE AND LOOP PILE IN THE SAME ROW OF STITCHING IN A NARROW GAUGE TUFTING MACHINE

Roy T. Card, Chattanooga, Tenn., assignor to Card & Co., Inc., Chattanooga, Tenn.

Filed Jun. 21, 1977, Ser. No. 808,646
Int. Cl.[2] D05C *15/24*
U.S. Cl. 112—79 R **7 Claims**



6. A looper apparatus for a tufting machine comprising:

(a) a hook comprising a shank having a mounting portion adapted to be mounted on the hook bar of a tufting machine, and a bill projecting from said shank and terminating in a free end portion,

(b) said bill having a top edge and a bottom edge converging into said free end portion,

(c) said bill comprising a cutting zone adapted to cooperate with a knife in said tufting machine to cut tufted loops on said bill,

(d) a spring clip having a body portion and a clamp portion,

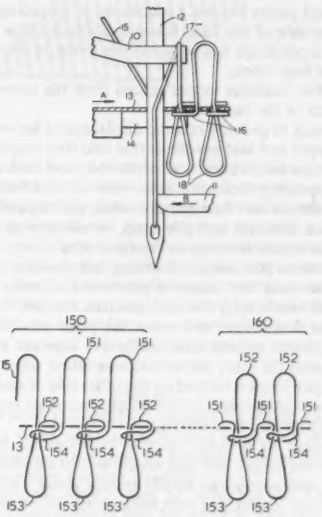
(e) means mounting said body portion upon said hook to normally bias said clamp portion against the free end portion of said bill, said body portion extending above said cutting zone, and all portions of said spring clip being transversely disaligned with said cutting zone.

4,103,630

TUFTING MACHINES AND METHOD

Norman Wignall, Blackburn, England, assignor to Cupa Engineering Co. Ltd., England

Filed May 17, 1976, Ser. No. 687,426
Int. Cl.[2] D05C *15/16*
U.S. Cl. 112—79 R **14 Claims**



1. A method of forming a double-sided pile fabric including repeatedly effecting the cycle comprising:

a. projecting a reciprocating eyed needle carrying yarn through said base fabric from one side thereof to form a non-pile loop of yarn on the other side of said base fabric;

b. advancing a first latchless looper through said non-pile loop;

c. retracting said needle to a position spaced from said one side of said base fabric while said non-pile loop is retained on said first looper;

d. advancing said base fabric along a path;

e. projecting said needle carrying said yarn through said base fabric to a dwell position wherein the point of said needle is adjacent said first looper to form a pile loop of yarn on said other side of said base fabric;

f. tensioning said yarn to cause said non-pile loop to slide off said first looper and about the end of said needle and to tighten around said needle and pile loop and against said other side of said base fabric;

g. withdrawing said first looper;

h. further advancing said needle with said pile loop;

i. advancing said first looper through said pile loop;

j. retracting said needle to a position spaced from said one side of said base fabric while said pile loop is retained on said first looper;

k. advancing said base fabric along said path and withdrawing said pile loop from said first looper; and

l. retaining said yarn with a reciprocating second latchless looper spaced from said one side of said base fabric while said needle is moved towards said base fabric following one of said steps (d) and (k) to form a pile loop on said one side of said base fabric;

m. whereby a succession of contiguous loops are formed on

said one side of said base fabric and a succession of spaced-apart loops are formed on the other side of said base fabric.

7. A machine for manufacturing a double sided pile fabric comprising:

a. at least one eyed needle;

b. drive means to reciprocate the needle through a base fabric;

c. means to feed the base fabric along a path past the needle so that, as the needle reciprocates, a yarn passing through the eye of the needle is passed from one side through to the other side the base fabric at a succession of spaced-apart points to form a succession of spaced-apart loops on one side of the base fabric and a succession of alternate non-pile loops and adjacent pile loops on the other side of the base fabric;

d. a first latchless looper spaced from the other side of said path of the base fabric;

e. means to provide relative displacement between said first looper and said needle so that said first looper alternately retains each alternate non-pile loop and each adjacent pile loop away from the other side of said base fabric and positions said first looper, while said looper is retaining each alternate non-pile loop, in advance of the point of said needle forming each adjacent pile loop;

f. means to pull the yarn forming said alternate non-pile loop while said first looper is positioned adjacent the point of said needle such that said alternate non-pile loop is slid off said first looper and about the point of said needle and tightened around said needle and adjacent pile loop and against the other side of said base fabric whereby a first set of pile loops is formed on the other side of said base fabric;

g. a second latchless looper spaced from said one side of said path of said base fabric; and

h. means to provide relative displacement between said second looper and said needle so that on alternate strokes of said needle the needle travels along one side of said second looper and then back along the other side of said second looper, carrying the yarn with it whereby alternate loops of the yarn are held away from the base fabric by said second looper to form a set of spaced-apart pile loops on the one side of said base fabric.

4,103,631

EMBROIDERY PUNCH

Sharon Mae Gray, Rte. 3, Box 166, Cheney, Wash. 99004

Filed May 20, 1977, Ser. No. 798,792

Int. Cl.[2] D05B *15/06*

U.S. Cl. 112—80 **3 Claims**

1. An embroidery tool, comprising:

a hollow elongated body having a female member and a male member that are reversibly frictionally interconnectible;

said male member having a hollow interior extending between a needle receiving end and an open opposite end;

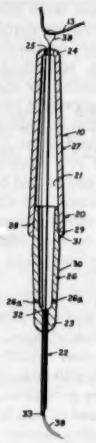
said male member having two exterior surfaces that are oppositely tapered inward toward respective ends of the male member;

an elongated hollow needle mounted to the needle receiving end of the male member in open communication with the hollow interior and projecting longitudinally from the male member a prescribed distance and terminating in a pointed tip;

said needle having a transverse eye formed adjacent the tip communicating with the hollow interior of the needle; and

said female member having a thread receiving opening formed in one end thereof communicating with a hollow interior that extends to an opposite end having a tapered female opening formed therein complementary to the tapered exterior surfaces of the male member for frictionally receiving either of the ends of the male member; and

said hollow interior of the female member having a length greater than the prescribed distance of the needle to encase the needle in the hollow interior of the female member when the needle receiving end of the male member is



received in the tapered female opening of the female member.

4,103,632

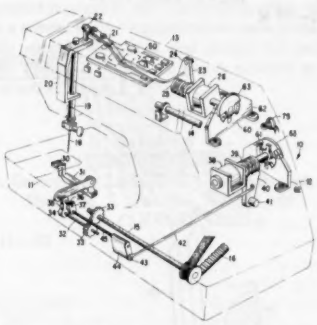
STEPPING MOTOR SHAFT POSITION DETERMINING ARRANGEMENT

Theodore L. Bowles, South Orange, N.J., assignor to The Singer Company, New York, N.Y.

Filed Oct. 20, 1977, Ser. No. 843,763

Int. Cl.[2] D05B *3/02*

U.S. Cl. 112—158 E **5 Claims**



1. In a sewing machine having at least one stitch forming instrumentality variable in position over a predetermined range of possible positions between successive stitches to produce a predetermined pattern of stitches, a stepping motor including a shaft operatively connected to impart movement to said stitch forming instrumentality over said predetermined range of positions, said stepping motor including a rotor member fixedly connected to said shaft and a plurality of diametrically opposed coil pairs circumferentially disposed about said shaft, and control means responsive to stitch pattern signals applied thereto for selectively and sequentially energizing said stepping motor coil pairs so as to move said rotor in discrete angular increments, the improvement comprising means for sensing which one of a plurality of defined angular sectors said shaft is in, said plurality of defined angular sectors being less than the number of discrete angular orientations which said shaft can assume, and means responsive to said sensing means and to a

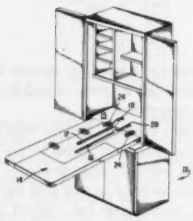
signal from said control means representative of which of said plurality of coil pairs is energized for determining the angular orientation of said shaft.

4,103,633

SEWING MACHINE TRACK STORAGE SYSTEM

Carl S. Frank, Clark; John J. Grzybowski, Rahway, and Robert S. Peets, Watchung, all of N.J., assignors to The Singer Company, New York, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,688
Int. Cl.[2] A47B *29/00*
U.S. Cl. 112—217.1 4 Claims



1. A track storage system for a sewing machine comprising an enclosure having an inside base; a work leaf attached to said enclosure and rotatable to form a horizontal extension of said inside base; guide means disposed on said work leaf and said inside base, said guide means on said inside base and on said work leaf providing an uninterrupted guide track system when said work leaf is rotated to form a horizontal extension of said inside base; means on said sewing machine for operatively engaging said guide means; said guide means including first portions disposed at the inside surface extremity thereof whereby a sewing machine can be horizontally turned to a position normal to its stored position within said enclosure, and said guide means including second portions disposed at the work leaf extremity thereof, accommodating translational movement of said sewing machine along said guide means to a work position on said work leaf.

4,103,634

CREST AND METHOD OF MANUFACTURE

Joseph D. Schachter, 866 Elm St., Winnipeg, Manitoba, Canada

Filed Jan. 7, 1977, Ser. No. 757,664
Claims priority, application Canada, Oct. 7, 1976, 262935
Int. Cl.[2] D05C *17/00*
U.S. Cl. 112—439 11 Claims

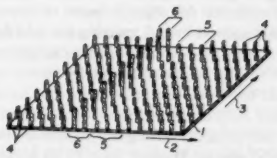
7. A crest comprising a chenille body having a surface containing a coloured design imprint of sublistatic ink, and stitched bound edges.

4,103,635

METHOD FOR MAKING TUFTED GOODS

Richard Sedlaczek, Wels, Austria, assignor to Edgar Pickering (Blackburn) Limited, Blackburn, England

Filed May 25, 1976, Ser. No. 690,030
Claims priority, application Austria, May 26, 1975, 3967/75
Int. Cl.[2] D05C *3/00, 15/00*
U.S. Cl. 112—266 4 Claims



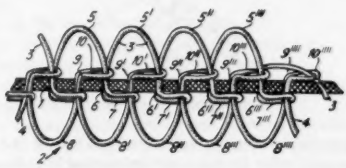
1. In a method for the manufacture of a pile fabric, wherein a rotary drive shaft is driven at a normal operating speed to operate needles punching yarns through a foundation for forming yarn loops thereon, and the rotation of the shaft is stopped in case of yarn breakage, the steps of continuously reducing the rotary speed of the shaft from the normal operating speed to a low speed before it is stopped from the low speed and then, after repair of the yarn breakage, restarting the shaft rotation at the low speed and thereafter continuously increasing the rotary speed of the shaft to the normal operating speed.

4,103,636

METHOD FOR INSERTING SEAMS IN BASE FABRIC

Gerald Frank Ward, and Gordon Richard Wray, both of Loughborough, England, assignors to National Research Development Corporation, London, England

Division of Ser. No. 509,021, Sep. 24, 1974, Pat. No. 4,041,884, which is a continuation of Ser. No. 883,876, Dec. 10, 1969, abandoned. This application Mar. 18, 1977, Ser. No. 778,923
Claims priority, application United Kingdom, Dec. 10, 1969, 1623/69
Int. Cl.[2] D05C *15/04*
U.S. Cl. 112—266 3 Claims



1. A method of forming a line of stitching of tufted fabric which includes continuously passing a base fabric through a tuft insertion zone, providing two needles, each with means to move the needle in turn through the base fabric so that they penetrate the fabric from opposite sides in the tuft zone, actuating the needles to move them with the base fabric when penetrating the fabric, each needle being threaded with a thread from an individual supply, causing one needle to pass a first doubled portion of its thread through the fabric at a first point of insertion, forming a portion of thread between the said point of insertion and the immediately previous point of insertion of the said one needle into a first tufting loop bridging the two said points of insertion, preventing part of the said first doubled portion from being pulled back through the fabric when said one needle is retracted so as to form a first 'double' loop on the opposite side of the fabric from said first tufting loop, causing said other needle to pass a doubled portion of the second thread through the fabric at a point less than a said first tufting

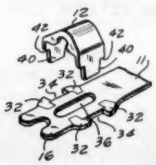
loop stitch length from the insertion point of said one needle, forming a portion of thread between the latter insertion point and the immediately previous point of insertion of the said other needle into a second tufting loop portion bridging the two latter points of insertion, preventing part of said doubled portion of the second thread from being pulled back through the fabric when said other needle is retracted so as to form a second 'double' loop on the opposite side of the fabric from said second tufting loop, causing the said first 'double' loop of the first thread to embrace the adjacent parts of two adjacent tufting loops on said second thread, causing the said first 'double' loop to lie prone on the fabric so as to lie around said two adjacent parts of tufting loops substantially at the point of penetration of said fabric by said adjacent parts, causing the said second 'double' loop of the second thread to embrace the adjacent parts of two adjacent tufting loops on said first thread and causing the said second 'double' loop to lie prone on the fabric so as to lie around said other two adjacent parts of tufting loops substantially at the point of penetration of said fabric by said adjacent parts, whereby the said prone loops are anchored at the bases of adjacent tufting loops, and repeating the passing of the threads alternately through the fabric to form a line of stitching in which tufting loops appear on both sides of the base fabric.

4,103,637

METHOD OF SHAPING A SCREW TYPE CLAMPING COLLAR

Andre R. Luc, Ozoir-la-Ferriere, France, assignor to Tridon-Serflex S. A., Bry-sur-Marne, France

Continuation of Ser. No. 692,335, Jun. 4, 1976, abandoned. This application Nov. 10, 1977, Ser. No. 850,358
Claims priority, application France, Jun. 4, 1975, 75 18313
Int. Cl.[2] B21O *45/00*
U.S. Cl. 113—116 M **8 Claims**



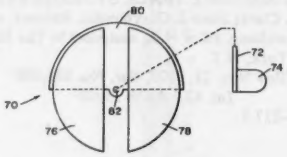
1. The method of treating a flexible band for use in a screw-type clamping collar having a saddle housing including a pair of spaced legs thereon comprising the steps of forming the flexible band of malleable material in a predetermined width, stamping one end of said band along its edges to extend the material of a predetermined portion of the band beyond the edges thereof and form transverse shoulders on said band edges in spaced relation to each other, whereby the legs of said housing may be placed between the shoulders and bent under the band with said shoulders, integral with the band, resisting longitudinal movement of the housing along the band and the forces applied thereto when the clamp is used; said stamping step comprising the steps of cutting an elongated slot in said one end of said band along its median axis in a length substantially equal to the desired spacing between shoulders on opposite sides of the band; enlarging said slot laterally by pushing the side edges of the slot, between an anvil and pressure plate, laterally outwardly towards adjacent edges of the band without changing the direction of said band; and punching the pushed out edges of the band to form recesses therein which define spaced transverse shoulders on the edges of the band.

4,103,638

AUTOMATIC PILOTING SYSTEM

John T. Fowler, Winthrop, Mass., assignor to The Laitram Corporation, Harahan, La.

Division of Ser. No. 630,539, Nov. 10, 1975, Pat. No. 4,038,528. This application Apr. 13, 1977, Ser. No. 787,271
Int. Cl.[2] B63H *25/36*
U.S. Cl. 114—144 E **6 Claims**



1. For use in an automatic piloting system in which rudder control signals are provided to control rudder position, a rudder angle indicator comprising:

a differential capacitor coupled to said rudder and including a first and a second capacitor respectively providing a first capacitance and a second capacitance;

said first capacitance increasing and said second capacitance correspondingly decreasing for rudder positions of one sense, said first capacitance decreasing and said second capacitance correspondingly increasing for rudder positions of opposite sense; and

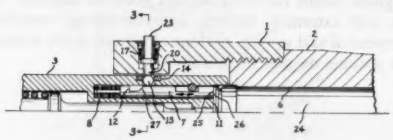
means operative in response to said first and second capacitances for providing a pulse width modulated signal, the pulse width of which is representative of rudder position.

4,103,639

GUN CHAMBER INDICATOR

Nelson Stuart Otteson, 6724 Caneel Ct., Springfield, Va. 22152

Filed Mar. 24, 1977, Ser. No. 780,990
Int. Cl.[2] F41C *27/12*; G08B *5/02*
U.S. Cl. 42—1 D **10 Claims**



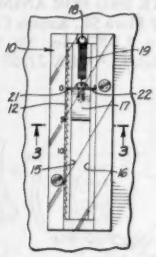
1. In a firearm, a breech bolt and a receiver, said breech bolt moving within said receiver from an unlocked and open position to a closed and locked position, and vice-versa, a barrel secured to a front portion of said receiver, a rear portion of said barrel containing a chamber, a head portion, said head portion being at the front part of said breech bolt and cooperating with said chamber when said breech bolt is in the closed and locked position to contain and support a cartridge when the cartridge is inserted into said chamber of said barrel, a spring-powered ejector means fitted into said head of said breech bolt to eject the cartridge from said firearm by spring power if the bolt is moved from the closed and locked position to the unlocked and open position, the improvement comprising a mechanical indicator means for determining the presence or the absence of a cartridge in said chamber of said firearm when said breech bolt is in said closed and locked position, said indicator means operationally coacting with said ejector means, said ejector means functioning as the probe for said indicating means for determining the presence or absence of a cartridge in said chamber, said indicator means being moveable to an indicating position by said ejector means in response to the presence of a cartridge in said chamber.

4,103,640

GRAVITY IMPACT INDICATOR FOR SHIPPING CONTAINERS

Leo Feder, 1734 Ellincourt Dr., South Pasadena, Calif. 91030

Filed May 19, 1977, Ser. No. 798,373
Int. Cl.[2] G01P *15/04*
U.S. Cl. 116—114 AH **10 Claims**



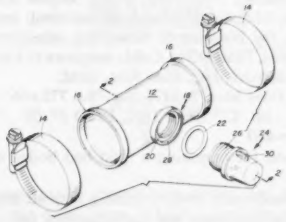
1. A gravity impact indicator for shipping containers carrying valuable delicate cargo, said indicator comprising a case, means for attaching said case to a shipping container, a weight mounted for vertical movement within the hollow interior of said case, resilient means normally restraining said weight against downward movement under normal gravity force, said resilient means comprising an elongated coil spring connected at its upper end to said case and at its lower end to said weight, said weight being adapted to move downwardly within said case upon said container being subjected to gravity impact greater than normal, means to restrain said weight against return upward movement, said means to restrain said weight comprising ratchet means engageable between said weight and said case, said ratchet means comprising a plurality of vertically spaced teeth carried by said case and means carried by said weight for engaging said teeth, means sealing said weight and weight restraining means against access from the exterior of said case to prevent changing the vertical position of said weight, and track means within said case for guiding downward movement of said weight.

4,103,641

SIGHT GAUGE DEVICE FOR FLEXIBLE LIQUID CARRIERS

Thomas R. Demyon, 6201 Loch Raven Blvd., Baltimore, Md. 21212

Filed Oct. 6, 1976, Ser. No. 729,924
Int. Cl.[2] G01F *23/02*
U.S. Cl. 116—117 C **1 Claim**



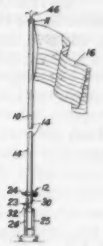
1. A sight gauge device for flexible liquid carriers comprising a cylindrical body means, a cylindrical port means in the side of said cylindrical body means, and a bulb-like observation means assembled to said cylindrical port means, said bulb-like observation means having at least one protrusion on the outside thereof to facilitate the assembly of said bulb-like observation means to said cylindrical port means, base clamp means, said cylindrical body means having flanged ends for insertion into and then for coupling to a flexible liquid carrier and secured thereto by said base clamp means around said flexible liquid carrier on the inboard side of each of said flanged ends of said cylindrical body means, the interior of said cylindrical body means communicates with the interior of said flexible liquid carrier into which each end of said cylindrical body means has been inserted with the interior of said cylindrical port means communicating with the interior of said cylindrical body means and also communicating with interior of said observation means assembled to said cylindrical port means, said observation means being hollow and formed of a transparently clear material wherein liquid level can be visually observed as the liquid flows by communication of and from said flexible liquid carrier into said cylindrical body means and then into said cylindrical port means and thence into said observation means, seal means, and said observation means being sealed by said seal means at the interface with said port means.

4,103,642

REMOTE THREADING FLAGPOLE

Gordon Swenson, 310 Arbuckle Rd., Erie, Pa. 16509

Filed Mar. 21, 1977, Ser. No. 781,770
Int. Cl.[2] E21C *29/18;* **G09F** *17/00*
U.S. Cl. 116—174 **10 Claims**



1. A remote threading flagpole comprising,
a pole,
a cap on the upper end of said pole,
a laterally extending slot in the top of said cap,
two horizontally spaced pulleys on said cap,
said slot being open at its top and disposed in said cap top tangentially to the top of said pulleys,
a rope having an intermediate part between its ends disposed in said slot passing around said pulleys and having its ends adapted to be attached to a flag,
a sleeve means slidably supported on the lower end of said flagpole,
at least one pulley on said sleeve means,
said rope passing around said pulley whereby the weight of said sleeve means exerts a downward force on said pulley holding said flag to said pole.

4,103,643

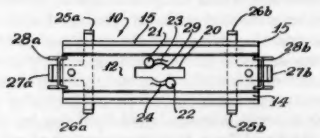
AEROSOL-REDUCING SLIDE HOLDER SYSTEM

John J. J. Staunton, Oak Park, Ill., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 428,295, Dec. 26, 1973, abandoned, which is a continuation of Ser. No. 341,347, Mar. 15, 1973, abandoned. This application Jun. 23, 1977, Ser. No. 809,504
Int. Cl.[2] B05C *11/08*
U.S. Cl. 118—50 **22 Claims**

1. Apparatus for holding a planar specimen slide during rotation by drive means comprising, in combination:
support means for said slide; and means for attaching said

support means to the drive means so that said support means may be rotated about a substantially vertical axis by said drive means, said support means including a cavity with at least one passage transverse to the vertical axis, mechanical means for at least lightly retaining said slide to said support means, said support means also including U-shaped ascending walls defining said cavity, said walls



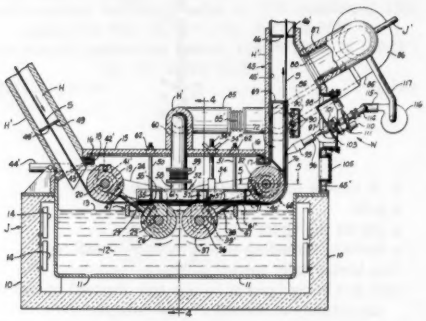
terminating in a substantially planar surface transverse to said axis for abutment with said planer slide so that positioning of said slide on said support means forms a tubular configuration having the ends thereof open to the atmosphere and rotation thereof by said drive means causes air within said configuration to be discharged via said open ends thereby creating a partial vacuum that tends to adhere said slide to said support means.

4,103,644

APPARATUS FOR COATING ONE SIDE ONLY OF STRIP MATERIAL

Norman C. Michels, 30500 Salem Dr., Bay Village, Ohio 44140

Filed Sep. 16, 1976, Ser. No. 724,079
Int. Cl.[2] B05C *1/08, 11/06*
U.S. Cl. 118—62 **24 Claims**



1. Apparatus for coating one side only of a strip material including a vessel having a bath of coating material in fluid condition therein, said coating material being adapted to change to substantially non-fluid condition after leaving said bath, a coating roll supported for rotation in said vessel partially submerged in said bath whereby said fluid coating material is picked up on the surface of said roll while rotating, means for moving said strip longitudinally in a path over said roll whereby one side only of said strip engages the fluid coating material on said roll and said coating material is transferred to said one side of said strip, gas manifold means extending in the direction of strip movement above said coating roll and said path of said strip thereover for a distance greater than the diameter of said coating roll, said manifold means having gas outlet means adapted to direct gas from said manifold means outwardly over both edges of the opposite uncoated side of said strip in unbroken flow from the area of first engagement of said strip and said coating material for a distance in the direction of strip movement greater than the diameter of said coating roll whereby contact of said coating material in fluid condition with said opposite side of said strip is prevented, and means for maintaining a flow of gas through said outlet means in said manifold.

4,103,645

WASTE BAG FOR ANIMALS

Harold E. Tyler, 3129 Flora St., Kansas City, Mo. 64109

Filed Jan. 7, 1977, Ser. No. 757,657
Int. Cl.[2] A01K *23/00*
U.S. Cl. 119—95 **3 Claims**

1. In a waste bag arrangement for animals such as dogs, the combination of:

trousers adapted to fit on the rear legs and rear body portion of the animal, said trousers presenting at least one opening therethrough;

means providing a relatively hard mounting surface on said trousers at a location substantially surrounding said opening;

a bag for containing the waste material of the animal, said bag having an open end for receiving the waste material;

a mounting pad secured to said bag at a location to substantially surround the open end thereof;

mating fasteners on said mounting surface and pad adapted to releasably secure said pad against said surface, thereby positioning the bag to receive the waste material discharged by the animal;

a disc member secured within said bag; and

means presenting a slit through said disc member for passage of the waste material therethrough.

4,103,646

APPARATUS AND METHOD FOR COMBUSTING CARBONACEOUS FUELS EMPLOYING IN TANDEM A FAST BED BOILER AND A SLOW BOILER

Joseph Yerushalmi, New York, N.Y.; Shelton Ehrlich, Palo Alto, Calif.; Mohammad Maaghoul, deceased, late of Sunnyvale, Calif. (by Nassrine S. Maaghoul, administratrix), and Terry E. Lund, Foster City, Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Mar. 7, 1977, Ser. No. 775,656
Int. Cl.[2] F22B *1/02;* **F23D** *19/00*
U.S. Cl. 122—4 D **9 Claims**

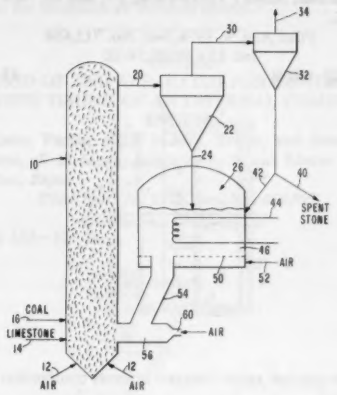
1. A method for operating a fluid bed boiler which comprises:

in a first combustion zone, fluidizing with air under fast bed conditions limestone and carbonaceous fuel, whereby a portion of said limestone and fuel are spent to provide a solid-gas mixture effluent;

transferring said solid-gas mixture effluent to a separation zone and separating solids from gases;

transferring said solids from separation zone to a second combustion zone, and fluidizing in said second combustion zone said solids with air under slow bed conditions, wherein unspent fuel from said first combustion zone is

consumed; said second zone having heat exchange tubes in heat exchanging relationship with said slow bed; and



circulating a major portion of solids exiting from said second combustion zone to said first combustion zone.

4,103,647

APPARATUS FOR DRYING WET STEAM AND SUBSEQUENTLY SUPERHEATING THE DRIED STEAM

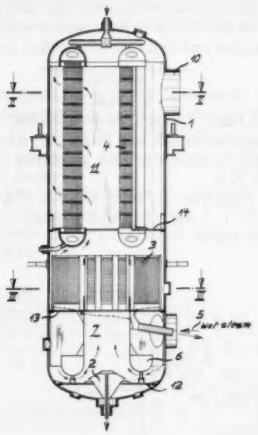
Rolf Dörling, and Klaus Westebbe, both of Gummersbach, Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Dec. 9, 1976, Ser. No. 748,962

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1975, 2555539

Int. Cl.[2] F22G *1/00*; F22B *1/16, 37/26*

U.S. Cl. 122—483 **7 Claims**



1. An apparatus for drying wet steam and subsequently superheating the dried steam, which includes in combination: an upright cylindrical container having an axis as well as a lower bottom and an upper bottom, a coarse separator arranged inside said container and within the region of said lower bottom, a fine separator arranged within said container and following said coarse separator in axially upward direction of said coarse separator, said container being provided with upwardly directed coaxial passage means, and superheating elements arranged around said coaxial passage means and extending parallel to the container axis nearly up to said upper bottom.

4,103,648

INTERNAL COMBUSTION ENGINE WITH AIR RESERVOIR

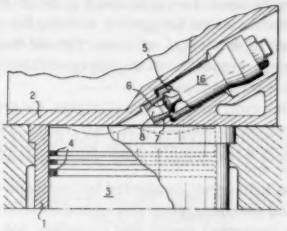
Philippe Jarry, Sevres, France, assignor to Le Moteur Moderne, Boulogne-Billancourt, France

Filed Oct. 7, 1976, Ser. No. 730,321

Claims priority, application France, Oct. 17, 1975, 75 31775

Int. Cl.[2] F02B *41/00*

U.S. Cl. 123—30 R **9 Claims**



1. An internal combustion engine comprising at least one cylinder, a piston within said cylinder and defining a chamber therewith, said piston being movable alternately between top dead center and bottom dead center positions within said cylinder, means carried by said engine providing for a continuous operating cycle including, in sequence, intake, compression, power and exhaust stages, said operating cycle means including in said compression stage means for introducing into said chamber a charge of air for compression therein during movement of said piston toward top dead center, means defining a reservoir in communication with said chamber, means for charging said reservoir with a fraction of the air introduced into said chamber during said compression stage, means operable during said power stage for temporarily capturing within said reservoir the fraction of air charged therein and preventing communication between said reservoir and said cylinder, and means operable at the beginning of the next compression stage for restituting to said chamber the fraction of air previously charged into said reservoir.

4,103,649

METHOD AND SYSTEM FOR CONTROLLING THE MIXTURE AIR-TO-FUEL RATIO

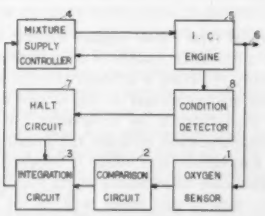
Eizi Matumoto, and Hideaki Norimatsu, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 2, 1976, Ser. No. 692,049

Claims priority, application Japan, Jun. 17, 1975, 50-73970

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EE **9 Claims**



1. An air-fuel mixture ratio control system for internal combustion engines comprising:

an oxygen responsive sensor, positioned in an exhaust pas-

sage of an engine, for producing a sensor signal indicative of the oxygen concentration threrein;

a comparison circuit, connected to said sensor, for producing a comparison signal in response to said sensor signal, said comparison signal having two constant signal levels indicative of the oxygen presence and the oxygen absence, respectively;

an integration circuit, connected to said comparison circuit and including an operational amplifier and a capacitor adapted to be charged and discharged in response to said comparison circuit, for producing an integration signal changing in the increasing and decreasing directions in response to said signal levels of said comparison signal;

a mixture supply controller, positioned in an intake passage and connected to said integration circuit, for supplying said engine with air-fuel mixture, the air-to-fuel ratio thereof being responsive to engine operating conditions and said integration signal;

a condition detector, coupled to said engine, for producing a detection signal indicative of at least one of full-opening and full-closing of a throttle valve and inoperativeness of said sensor; and

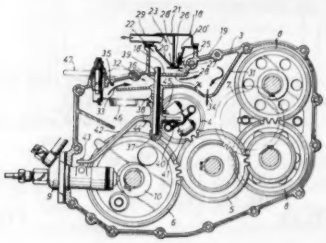
an integration half circuit, connected between said condition detector and said integration circuit and including switching means connected across said capacitor, for short-circuiting said capacitor by said switching means in response to said detection signal to thereby halt the integration operation and cause said mixture air-to-fuel ratio to be irresponsive to said integration signal.

4,103,650

HORIZONTAL TYPE DIESEL ENGINE

Tsuyoshi Nishida; Satoshi Tabushe, and Kouichi Akeda, all of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Sep. 20, 1976, Ser. No. 724,864
Int. Cl.² F01M *13/00*
U.S. Cl. 123—41.86 **10 Claims**



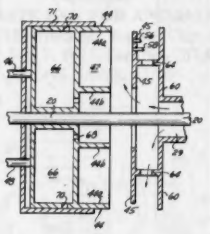
1. A horizontal type Diesel engine wherein a gear case is juxtaposed to a crankcase axially of a crank shaft, said crankcase horizontally receiving a cylinder therein, and a radiator and a fuel tank are juxtaposed on top of said crankcase, said engine being characterized by comprising a breather which establishes communication between the interior of said gear case and the atmosphere and which is disposed on the upper wall of said gear case substantially at the middle between the front and rear ends of said upper wall, an oil partition wall opposed to said breather and disposed in said gear case, a pre-breather chamber defined between said oil partition wall and said upper wall mounting said breather thereon, and a governor shaft pivotally vertically supported by said gear case and having one end thereof projecting into said breather.

4,103,651

INTERNAL COMBUSTION-GAS TURBINE ENGINE

John S. Larkins, Moun't Valley Farm, #5, Box 60, New Castle, Va. 24127

Filed Aug. 9, 1976, Ser. No. 712,658
Int. Cl.² F02B *59/00*
U.S. Cl. 123—50 B **23 Claims**



1. An air-cooled, super charged internal combustion engine comprising:

a stationary piston having an end face portion;

a cylinder movable longitudinally relative to said piston face portion from a first abutting position to a second spaced position; a compression chamber formed therebetween in said first position;

means for providing a pressurized air flow stream;

a plurality of ports in said cylinder for passing said stream therethrough;

a further port associated with said piston for passing said stream in cooling proximity to the back surface of said piston face portion;

means for admitting a fuel to said chamber;

means for igniting said fuel and providing such longitudinal movement of said cylinder from said first to said second position;

means enabling the cylinder to disengage contact with the piston in the second position;

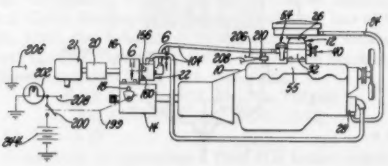
means for passing said stream through said cylinder responsive to its movement to said second position; and means for returning said cylinder to said first position.

4,103,652

AUXILIARY ENGINE GOVERNING SYSTEM

Arthur F. Garside, Grabil, and Dudley D. Avery, New Haven, both of Ind., assignors to Colt Industries Operating Corp., New York, N.Y.

Filed Feb. 23, 1977, Ser. No. 771,155
Int. Cl.² F02D *11/08*
U.S. Cl. 123—103 R **8 Claims**



1. A governor system for a vehicle driven by an internal combustion engine having a throttle valve for controlling the flow of combustible mixture to said engine, comprising a vacuum motor operatively connected to said throttle valve, means communicating said vacuum motor to a source of vacuum, air bleed means for rendering said vacuum motor inoperative, means responsive to the speed of said engine for at selected engine speeds restricting said air bleed means and causing actuation of said vacuum motor, and additional valving means constructed and arranged to be effective at selected conditions

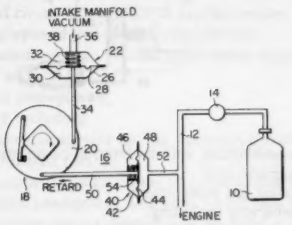
of engine operation for providing an auxiliary passage for communication between said vacuum motor and a source of vacuum for actuation of vacuum motor.

4,103,653

METHOD OF AND APPARATUS FOR CONTROLLING IGNITION TIMING OF AN INTERNAL COMBUSTION ENGINE

Zene Ueno, Fuchu; Akira Morita, Tokyo, and Atushi Chida, Sayama, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Nov. 28, 1975, Ser. No. 635,867
Int. Cl.[2] F02P *5/04*
U.S. Cl. 123—117 R **7 Claims**



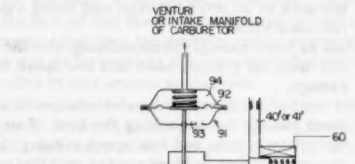
1. An ignition timing control apparatus in combination with an internal combustion engine including an ignition distributor, a source of auxiliary fuel, and conduit means for providing communication between said source of auxiliary fuel and said engine for feeding auxiliary fuel thereinto in addition to a main fuel, said apparatus comprising variable control means for communicating with said conduit means and the position of which is varied in accordance with the amount of said auxiliary fuel fed to said engine, and connecting means for operatively connecting said variable control means to said ignition distributor for variably controlling the ignition timing of said engine in accordance with the position of said variable control means.

4,103,654

METHOD AND APPARATUS TO CONTROL AIR/FUEL RATIO OF THE MIXTURE APPLIED TO AN INTERNAL COMBUSTION ENGINE

Koyo Nakamura, Yokosuka, Japan, assignor to Nissan Motor Company, Ltd., Japan

Filed Oct. 31, 1975, Ser. No. 627,860
Claims priority, application Japan, Nov. 1, 1974, 49-126241
Int. Cl.[2] F02B *73/10;* **F02H** *3/00;* **F02M** *37/00*
U.S. Cl. 123—119 EC **6 Claims**



1. In an internal combustion engine including an intake passage, an exhaust passage and a carburetor forming part of the engine intake passage and having a fuel delivery passage fluidly connected between the engine intake passage and a source of fuel supply and a calibrated fuel jet located in said fuel delivery passage,

an apparatus to control the ratio of air to fuel of the air/fuel mixture being delivered to the engine, comprising

means sensing the concentration of a gas component of the exhaust gases through the exhaust passage which is related to the ratio of air to fuel of the air/fuel mixture and generating an electric output signal indicative of the sensed concentration of the gas component,

additional air passage means fluidly connected between the atmosphere and said fuel delivery passage at a portion downstream of said fuel jet,

electromagnetic means actuable in accordance with said output signal for controlling the rate of air passing through said additional air passage means, and

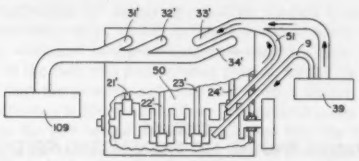
means for limiting the flow rate of the additional air through said additional air passage means in accordance with the vacuum being created by operation of the engine in a portion of the engine intake passage.

4,103,655

INTERNAL COMBUSTION ENGINE

Donald Kennedy Coles, 2505 Capitol Ave., Fort Wayne, Ind. 46806

Filed Mar. 22, 1977, Ser. No. 780,172
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—119 B **2 Claims**



1. An internal combustion engine having a special combustion chamber and a plurality of M ordinary combustion chambers, each combustion chamber being partly bounded by its movable piston, all the pistons being mechanically coupled to a common power output shaft, each combustion chamber having an air inlet port, exhaust port, and associated means for executing a series of combustion chamber cycles, each cycle including air intake, compression, expansion and exhaust, the engine having means for taking a ration of fuel in each of its combustion chamber cycles,

a single enclosure receiving air and fuel leaking past the pistons from all of the combustion chambers,

a duct connecting the enclosure to the air inlet port of the special combustion chamber and not to the ordinary combustion chambers, the duct conveying the air and fuel leaking from all of the combustion chambers to be reburned in the special combustion chamber only,

torque control means, overriding the fuel taking means, for enabling the fuel ration in every cycle of the special combustion chamber and for partially inhibiting the fuel rations for the ordinary combustion chambers in a repetitive pattern of successive enabled and inhibited combustion chamber cycles, the period of repetition containing N cycles of each of the combustion chambers, of which P cycles of each ordinary combustion chamber have their fuel ration inhibited, where N is a plural integer, P is an integer greater than zero and smaller than N,

the total number of inhibited cycles of all of the combustion chambers within the period of repetition being MP, the product of M and P.

2. An improved internal combustion engine having at least first and second combustion chambers, each combustion chamber being partially bounded by its movable piston, the two pistons coupled to a common power output shaft, each combustion chamber having an air inlet port, exhaust port, and associated means for executing a series of combustion chamber

cycles, each chamber cycle including air intake, compression, expansion and exhaust,

a primary fuel supply to the first combustion chamber,

a primary fuel supply to the second combustion chamber,

a single enclosure receiving air and fuel leaking past the pistons from both the first and second combustion chambers,

a duct connecting the enclosure to the air inlet port of the second combustion chamber only and not to the first combustion chamber, the duct conveying the air and fuel leaking from the first and second combustion chambers to be reburned in the second combustion chamber only,

the improvement comprising:

first means for enabling and inhibiting the primary fuel supply to the first combustion chamber separately from the second combustion chamber,

second means for enabling and inhibiting the primary fuel supply to the second combustion chamber separately from the first combustion chamber,

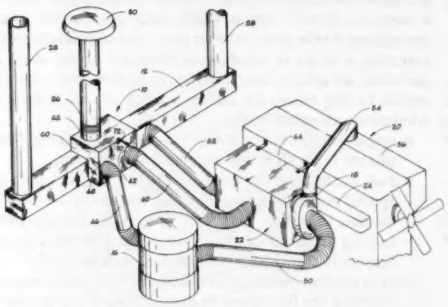
an interlock, coupled to the first and second enabling means for ensuring that the primary fuel supply to the second combustion chamber is completely enabled whenever the primary fuel supply to the first combustion chamber has been enabled during the current cycle or the immediately preceding cycle of the second combustion chamber.

4,103,656

TRUCK ENGINE AIR PREHEATING SYSTEM

Aaron Reddekopp, 12056 N. Jantzen Beach Ave, Portland, Oreg. 97217

Filed Feb. 28, 1977, Ser. No. 773,010
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—122 D **8 Claims**



1. In combination with a truck tractor including an engine having a hot exhaust manifold and a turbocharger,

a muffler extending crosswise of the tractor and connected to the exhaust manifold,

a valve mounted on the muffler having a preheated air inlet, a cold air inlet, an outlet and closure means selectively movable between a normal condition wherein the cold air inlet is connected to the outlet and the preheated air inlet is closed and a preheating condition in which the preheated air inlet is connected to the outlet and the cold air inlet is closed,

a manifold chamber in a heat exchange relationship with the hot exhaust manifold and connected to the preheated air inlet,

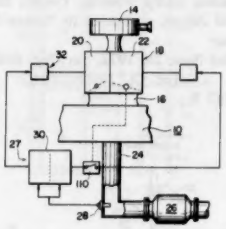
and means connecting the outlet of the valve to the turbocharger.

4,103,657

TWIN-BARREL CARBURETOR WITH AN AIR-FUEL RATIO CONTROL DEVICE

Hidehiro Minami, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 11, 1976, Ser. No. 695,185
Claims priority, application Japan, Jun. 13, 1975, 50-81031
Int. Cl.[2] F02M *7/24*
U.S. Cl. 123—127 **4 Claims**



1. In combination with an internal combustion engine,

a carburetor, and

an exhaust gas passageway,

the carburetor including:

a primary intake passageway having:

a primary throttle valve rotatably mounted therein,

a primary main fuel passage communicating with the primary intake passageway and from which fuel is drawn into the primary intake passageway,

a primary low speed running fuel passage communicating with the primary intake passageway and from which fuel is drawn into the primary intake passageway;

a secondary intake passageway having:

a secondary throttle valve rotatably mounted therein,

a secondary main fuel passage communicating with the secondary intake passageway and from which fuel is drawn into the secondary intake passageway,

a secondary low speed running fuel passage communicating with the secondary intake passageway and from which fuel is drawn into the secondary intake passageway;

an improved air-fuel ratio control system comprising:

a sensor located in the exhaust gas passageway for sensing the concentration of a component contained in exhaust gases of the engine and for generating an electric signal representative of the sensed concentration of the component, said concentration being a function of the air-fuel ratio of an air-fuel mixture formed by the carburetor,

a control circuit electrically connected to said sensor to be responsive to said signal for comparing the value of said signal with a reference value representative of a desired air-fuel ratio and for generating a command signal representative of an error between said signal value and said reference value,

a first air bleed passage communicating with the atmosphere and with the primary main and low speed running fuel passage,

first control valve means located relative to said first air bleed passage for controlling the flow of air drawn into the primary main and low speed running fuel passages through said first air bleed passage, said first control valve means being electrically connected to said control circuit and being operable, in response to said command signal, for reducing and increasing the flow of said air, thereby respectively to increase and reduce the flow of fuel drawn from the primary main and low speed running fuel passages into the primary intake passageway and to control the air-fuel ratio of an air-fuel mixture formed by the carburetor to said desired air-fuel ratio,

a second air bleed passage communicating with the atmosphere and with the secondary main and low speed running fuel passages,

second control valve means located relative to said second air bleed passage for controlling the flow of air drawn into the secondary main and low speed running fuel passages through said second air bleed passage, said second control valve means being electrically connected to said control circuit and being operable, in response to said command signal, for reducing and increasing the flow of said air, thereby respectively to increase and reduce the flow of fuel drawn from the secondary main and low speed running fuel passages into the secondary intake passageway and to control the air-fuel ratio of an air-fuel mixture formed by the carburetor to said desired air-fuel ratio, and

a switch means interposed between said control circuit and said second control valve means for connecting and disconnecting said second control valve means to and from said control circuit in response to said secondary throttle valve being opened and closed, respectively.

2. In combination with an internal combustion engine,

a carburetor, and

an exhaust gas passageway;

the carburetor including:

a primary intake passageway having a primary throttle valve rotatably mounted therein,

primary fuel supply passage means communicating with the primary intake passageway and from which fuel is drawn into the primary intake passageway to form a primary air-fuel mixture,

a secondary intake passageway having a secondary throttle valve rotatably mounted therein,

secondary fuel supply passage means communicating with the secondary intake passageway and from which fuel is drawn into the secondary intake passageway to form a secondary air-fuel mixture;

an improved air-fuel ratio control system comprising:

sensing means located in the exhaust gas passageway for sensing the concentration of a component contained in exhaust gases of the engine for generating an electric signal representative of the sensed concentration of the component, said concentration being a function of the air-fuel ratio of an air-fuel mixture formed by the carburetor,

a control circuit electrically connected to said sensing means to be responsive to said signal for comparing the value of said signal with a reference value representative of a desired air-fuel ratio and for generating a command signal representative of an error between said signal value and said reference value,

first fuel flow control means electrically connected to said control circuit to be responsive to said command signal and associated with said primary fuel supply passage means for adjusting, in accordance with said command signal, the flow of fuel drawn from the primary fuel supply passage means into the primary intake passageway, whereby the air-fuel ratio of the primary air-fuel mixture is controlled to said desired air-fuel ratio,

second fuel flow control means electrically connected to said control circuit to be responsive to said command signal and associated with said secondary fuel supply passage means for adjusting, in accordance with said command signal, the flow of fuel drawn from the secondary fuel supply passage means into the secondary intake passageway, whereby the air-fuel ratio of the secondary air-fuel mixture is controlled to said desired air-fuel ratio, and

switch means interposed between said control circuit and said second control valve means for connecting and disconnecting said second control valve means to and from said control circuit in response to said secondary throttle valve being opened and closed, respectively.

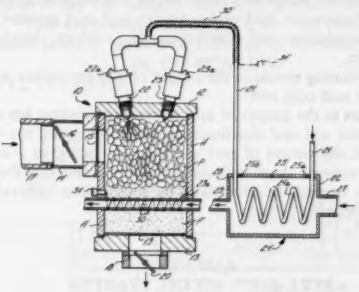
4,103,658
CARBURETOR

Gunther Bernecker, Montvale, N.J., assignor to Donald B. Conlin, Mahwah, N.J., a part interest

Continuation-in-part of Ser. No. 806,798, Jun. 15, 1977, which is a continuation-in-part of Ser. No. 770,964, Feb. 22, 1977, Pat. No. 4,086,893. This application Jan. 26, 1978, Ser. No. 872,707

Int. Cl.[2] F02M *33/00*

U.S. Cl. 123—133 **4 Claims**



1. A carburetor for supplying a fuel/air mixture to an internal combustion engine having an intake manifold comprising a housing, contained in the housing only matter which is inert relative to the fuel, said matter being porous, means for injecting fuel into the housing and onto said porous matter, means for transferring sufficient heat from the exhaust gases of the engine to the fuel before the fuel is injected into the housing and means for transferring sufficient heat to the housing and the porous matter so that all the fuel is completely vaporized when it leaves the housing, means for admitting air into the housing simultaneously with the injection of the fuel to form a mixture with all the vaporized fuel and means for conducting the entire mixture out of the housing directly to the intake manifold during all phases of operation of the engine, for combustion in the engine.

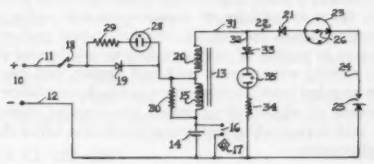
4,103,659
IGNITION SYSTEM

Donald S. Donigian, 6016 West Fullerton, Chicago, Ill. 60639

Continuation-in-part of Ser. No. 494,453, Aug. 5, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,185

Int. Cl.[2] F02P *1/00*

U.S. Cl. 123—148 DC **4 Claims**



1. In an ignition system as used with a gas internal combustion engine comprising

(a) an ignition circuit including a power source and an on-off switch,

(b) an ignition coil having a primary and secondary winding,

(c) switch means adapted to close and open between said power source and said primary winding of said ignition coil and adapted when open and closed to develop surge and oscillatory voltages therein,

(d) a capacitor connected in series with said primary winding of said coil and adapted to be shunted by said switch means so as to be responsive to said switch means' open

condition to prevent electrical current flow in said primary winding of said ignition coil from said power source and to permit electrical current flow when said switch is in its closed condition,

(e) means in the circuit between said power source and said ignition coil cooperating with said capacitor for preventing dissipation of the surge and oscillatory voltages in said circuit during the open condition of said switch means through said ignition circuit and said power source,

(f) a gaseous lamp and series-protective resistance in the circuit between said power source and said ignition coil for regulating and stabilizing the voltage developed therein,

(g) distributing means in the output of said secondary winding of said coil, and

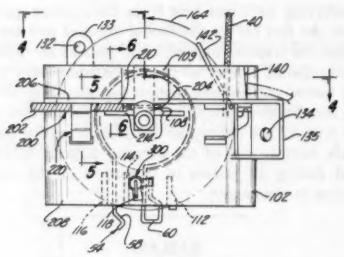
(h) means in the output of said secondary winding between said coil and said distributing means converting the voltage of the output of said secondary winding to a single unidirectional high voltage impulse to said distributing means immediately followed by a quiescent interval for each ignition period.

4,103,660

PULL-ROPE RECOIL STARTER

Paul T. Reese, New Holstein, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Division of Ser. No. 576,199, May 9, 1975, Pat. No. 4,019,490.
This application Jan. 5, 1977, Ser. No. 757,032
Int. Cl.[2] B60K *41/04*
U.S. Cl. 123—179 K **5 Claims**



1. The combination comprising an internal combustion engine, a propulsion system coupled to said engine including a transmission having at least neutral and drive positions, and a pull-rope recoil starter for starting said engine including a pull-rope and support means fixedly attached to said engine having slot means extending generally in the direction of normal pulling force exerted by an operator on said pull-rope, engine cranking means operatively coupled to said pull-rope and responsive to pulling of said rope to translate in said slot means into starting engagement with said engine, and means operatively coupled to said transmission to block translation in said slot means of said cranking means into starting engagement with said engine when said transmission is in other than said neutral position.

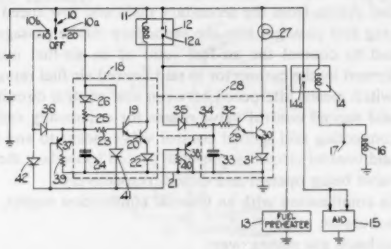
4,103,661

DIESEL ENGINE STARTING SYSTEMS

William David Holt, Cologne, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jan. 26, 1977, Ser. No. 762,643
Claims priority, application United Kingdom, Jan. 30, 1976, 3678/76
Int. Cl.[2] F02N *17/00*
U.S. Cl. 123—179 H **5 Claims**

1. A control circuit for a diesel engine starting system including a starting aid device and a fuel preheater device, said circuit comprising a selector switch having an off position and first and second on positions, a first delay circuit for operating the fuel preheater device, a second delay circuit for operating for an indicator to indicate when cranking of the engine can be commenced, and means for operating the starting aid device when the selector switch is moved to its first on position, the devices being so connected to the delay circuits that when the switch is moved to its first on position there is a first delay before the fuel preheater device is operated and a second delay



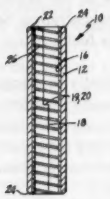
before the indicator is operated, but when the switch is moved to its second on position, there is no delay before the fuel preheater device is operated and only said second delay elapses before the indicator is operated, wherein said delay circuits comprise a resistor-capacitor delay network and a transistor controlled by the voltage on the capacitor, and a reset circuit for causing discharge of both capacitors when the switch is in its off position.

4,103,662

INSERT FOR REBUILDING VALVE GUIDES

James A. Kammeraad, Holland, Mich., assignor to K-Line Industries, Inc., Holland, Mich.

Filed Sep. 2, 1976, Ser. No. 719,958
Int. Cl.[2] F01L *3/08*
U.S. Cl. 123—188 GC **15 Claims**



1. A valve guide insert for lining and relining the entire length of a valve guide of an internal combustion engine comprising an outer, metallic, cylindrical sleeve having an outside diameter adapted to be press-fitted within a valve guide and an inside diameter adapted to receive an inner sleeve; and a separate, wear-resistant, metallic, inner cylindrical sleeve located concentrically within, being substantially coterminous with, and extending the entire length of said outer sleeve, the metal of said inner sleeve being dissimilar to that of said outer sleeve, said inner sleeve having an outside diameter slightly larger than said inside diameter of said outer sleeve before insertion in the outer sleeve such that the outside wall surface of said inner sleeve tightly, frictionally engages the slightly smaller, inside wall surface of said outer sleeve after insertion to positively retain said sleeves together, said inner sleeve having an inside diameter adapted to receive a valve stem therethrough whereby the separate formation and subsequent assembly of said inner and outer sleeves allows precise control of tolerances, wall thicknesses and concentricities of said insert and provides strength, wear-resistance, and an outer diameter adapted for installation with standard size, commonly available installation tools.

4,103,663

CYLINDER HEAD FOR INTERNAL COMBUSTION ENGINES, ESPECIALLY DIESEL ENGINES

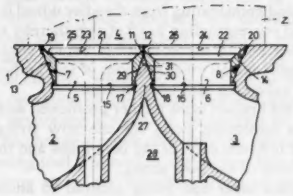
Ludwig Elsbett and Günter Elsbett, both of Industriestr. 14, D8543 Hilpoltstein, Fed. Rep. of Germany

Filed Nov. 12, 1976, Ser. No. 741,351

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1975, 2550781

Int. Cl.[2] F01L 3/00

U.S. Cl. 123—188 S 14 Claims



1. A cylinder head for internal combustion engines, especially Diesel engines, which includes wall means defining passage means and a mouth section therefor for communication with a combustion chamber, said mouth section comprising an inner portion and an outer portion and a conical surface flaring outwardly from said inner portion to said outer portion, and valve seating ring means having an outer peripheral surface substantially parallel to and adjacent said conical surface, while projecting over the latter, said valve seating ring means being connected to said inner portion only of said mouth section and having its inner peripheral surface provided with a valve seating area, thermal insulation means between the outer peripheral surface of said valve seating ring means and the adjacent surface of said mouth section, said thermal insulation means between said valve seating ring means and the wall means of said mouth section being provided only within the region of said valve seating area and that rim portion of the respective valve seating ring means which is remote from said inner mouth portion.

4,103,664

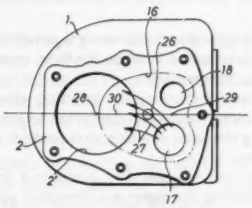
COMBUSTION CHAMBER FOR COMPACT ENGINE OF THE SIDE VALVE TYPE FOR UNIVERSAL USE HAVING CONTACTLESS IGNITION SYSTEM

Kiyonobu Iida; Yoshio Tani, and Kouichi Sugahara, all of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Sep. 21, 1976, Ser. No. 725,187

Int. Cl.[2] F02B 23/00

U.S. Cl. 123—191 L 6 Claims



1. In a combustion chamber for a compact engine of a side valve type having a contactless ignition system said engine comprising a cylinder, an intake valve, an exhaust valve and an ignition plug, the improvement wherein the spark gap portion of the ignition plug is positioned in said combustion chamber on a line extending from the center of the cylinder to the midpoint between the edges of said intake valve and said exhaust valve and midway between the center of said cylinder and said midpoint, and wherein said spark gap is opposed to a bundle of streams of an air fuel mixture drawn into said combustion chamber through said intake valve.

4,103,665

LUBRICATING DEVICE FOR INTERNAL COMBUSTION ENGINES

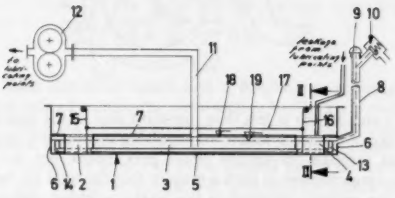
Johann Prasch, Sindorf, Fed. Rep. of Germany, assignor to Klöckner-humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Division of Ser. No. 503,491, Sep. 5, 1974, Pat. No. 4,023,548. This application Feb. 14, 1977, Ser. No. 768,336

Claims priority, application Fed. Rep. of Germany 2344949

Int. Cl.[2] F02M 1/00

U.S. Cl. 123—196 R 2 Claims



1. A lubricating device for an internal combustion engine for securing the oil supply to the points to be lubricated, also in greatly inclined positions of said device, which includes: a longitudinal oil pan comprising a closed main chamber, a first open auxiliary chamber arranged near one end of said oil pan, and a second open auxiliary chamber arranged near the other end of said oil pan, the major portion of said main chamber being located between said first and second auxiliary chambers, said main chamber also including a space between each of said auxiliary chambers and the respective adjacent end wall of said oil pan; pressure pump means having a pressure side for connection with an oil conveying line leading to points to be lubricated, said pressure pump also having a suction side, first conduit means establishing communication between said suction side and the interior of said closed main chamber; second conduit means leading from the space between one of said open auxiliary chambers and the adjacent end wall of said oil pan to the outer one of said open auxiliary chambers, and third conduit means leading from said one auxiliary chamber to said other auxiliary chamber, and a delivery pump interposed in said third conduit means.

4,103,666

FUEL SUPPLY MEANS FOR ROTARY PISTON ENGINES

Masaharu Shimoji; Yasuo Tatsutomi, both of Hiroshima; Yutaka Hirose, Aki; Atsumichi Yamasaki, and Katsuaki Kikura, both of Hiroshima, all of Japan, assignors to Toyo Kogyo Co., Ltd., Japan

Filed May 26, 1976, Ser. No. 690,319

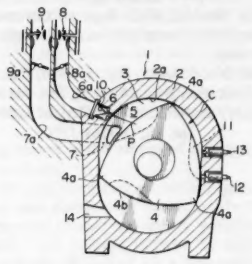
Claims priority, application Japan, May 26, 1975, 50-63178

Int. Cl.[2] F02B 53/04

U.S. Cl. 123—219 9 Claims

1. Rotary piston engine comprising a casing which includes a rotor housing having an inner wall of trochoidal configuration and a pair of side housings secured to the opposite sides of the rotor housing to define therein a rotor cavity of trochoidal configuration, and a rotor of substantially polygonal configuration disposed in said rotor cavity of the casing for revolution and rotation with apex portions in sliding contact with the inner wall of the rotor housing so as to define working chambers of variable volume between flank portions thereof and the trochoidal inner wall of the rotor housing, each of the flank portions of the rotor being formed with a recess at a leading part thereof, first intake port means formed in said rotor housing and located at such a position that it is closer to the preceding rotor apex portion than to any of the other rotor apex

portions when the rotor is in the intake top dead center, means for supplying rich air-fuel mixture having an air-fuel ratio of 2 to 6 through the first intake port means into the intake working chamber, second intake port means formed in at least one of the side housings, said first intake port means having an effective area which is less than one-third that of the said second intake port means, means for supplying combustion sustaining fluid through the second intake port means into the intake working chamber in such a manner that the total air-fuel ratio of the mixture supplied to the intake working chamber becomes 15 to 20.



4,103,667

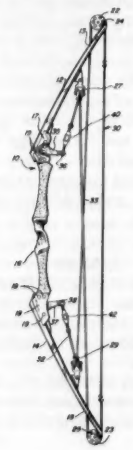
BOW STRING MOUNTING AND TENSIONING BRACKETS

Paul E. Shepley, Jr., Rte. 1, Mahomet, Ill. 61853

Continuation of Ser. No. 541,718, Jan. 17, 1975, abandoned. This application May 2, 1977, Ser. No. 792,880

Int. Cl.[2] F41B *5/00*

U.S. Cl. 124—24 R **5 Claims**



1. In an archery bow of the type having a pair of resilient bow limbs joined to a handle section, each of the bow limbs provided with a bifurcated outer end and having an eccentric pulley mounted within the bifurcated end, each of the bow limbs further provided with an idler wheel mounted interiorly thereof and spaced inwardly from the corresponding eccentric pulley, a bow string having opposed ends and having a central stretch portion carried between the ends of the pair of bow limbs and circumscribing the essentric pulleys, and the opposed ends having a portion of one of the opposed ends of the bow string circumscribed thereabout and terminating at an inner end adapted for mounting to the archery bow, the improvement comprising in combination,

mount means provided on said archery bow, to provide a mount for the inner ends of the bow string,

said mount means comprising a pair of bracket arms, one of each of said bracket arms mounted on the opposed end of said handle section and positioned intermediate the corresponding idler wheel and handle section and extending laterally inwardly for a distance to an inward end,

the inward end of each of said bracket arms forming the sole and only point of attachment and anchoring of a corresponding inner end of the bow string such that the bow string end emmanating from the idler wheel is anchored to the said corresponding bracket arm thereby to insure that the inner end of the bow string avoids contact with the bow limbs and all other portions of said archery bow at all points excepting said bracket arm,

each of said bracket arms further positioned and arranged to form a tensioning point for the bow string at a point spaced between each of the bow limbs and the intermediate stretch of the bow string,

said bracket inner end being secured to anchor the bow string at a point spaced from the handle end, said bracket inner end being spaced from said handle a sufficient distance to define a vectoral force component perpendicular to the limb greater than that when the bowstring is attached at the bracket attachment to the handle while simultaneously reducing the corresponding parallel force component along the limb,

whereby a larger portion of the potential energy prior to release is directed perpendicularly to the flexed limb and the parallel component is reduced.

4,103,668

DRESSING APPARATUS FOR GRINDING WHEEL

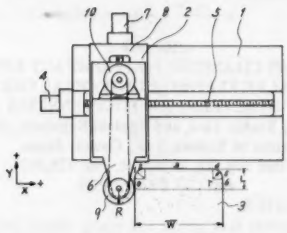
Hideo Nishimura, Nagoya, and Kunihiko Etoh, Toyota, both of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Japan

Filed Jul. 25, 1977, Ser. No. 818,837

Claims priority, application Japan, Jul. 30, 1976, 51-191481; Dec. 24, 1976, 51-157077

Int. Cl.[2] B24B *53/06*

U.S. Cl. 125—11 CD **7 Claims**



1. A dressing apparatus for dressing a grinding wheel having a straight portion and a circular portion continuous to the straight portion comprising:

a dressing tool for dressing the grinding wheel;

a first servomotor operably connected to said dressing tool for moving the same in a direction parallel with the axis of the grinding wheel;

a second servomotor operably connected to said dressing tool for moving the same in a direction perpendicular to the axis of the grinding wheel;

a mode counter for designating a mode of a dressing operation on the straight and circular portions of the grinding wheel, depending upon the content thereof;

a memory device for storing numerical information to move said dressing tool along the circular portion of the grinding wheel;

a pulse generator for generating a train of clock pulses;

a first gate circuit operably connected to said mode counter, said memory device and said pulse generator for distributing clock pulses from said pulse generator to said first and second servomotors in accordance with the content of

said mode counter and said memory device, when said mode counter designates a dressing operation on the circular portion;

means for generating a signal to be applied to said mode counter to change a mode of a dressing operation, when the pulse distribution is completed by said first gate circuit;

setting means for setting a moving amount of said dressing tool to dress the straight portion of the grinding wheel;

a second gate circuit operably connected to said mode counter and said pulse generator for distributing clock pulses from said pulse generator to one of said first and second servomotors in accordance with the content of said mode counter, when said mode counter designates a dressing operation on the straight portion; and

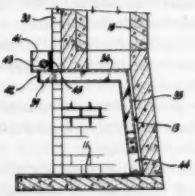
means for generating a signal to be applied to said mode counter to change a mode of a dressing operation, when said dressing tool is moved by one of said first and second servomotors along the straight portion of the grinding wheel by the moving amount set in said setting means.

4,103,669

FIREPLACE HEAT EXCHANGER ASSEMBLY

Eugene E. Pauley, 45 Coral Dr., Belleville, Ill. 62221

Filed Jun. 3, 1976, Ser. No. 692,570
Int. Cl.[2] F24B 7/00
U.S. Cl. 126—121 **4 Claims**



1. In a fireplace heat exchanger assembly:

(a) a conduit having an air inlet and an air outlet located outwardly of the fireplace, the conduit including:

(1) a first passage communicating with the air inlet and extending rearwardly across the top of the fireplace, and

(2) a second passage communicating with the first passage at the rear of the fireplace and extending forwardly across the top of the fireplace for communication with the air outlet,

(b) support means for holding the conduit at the top of the fireplace,

(c) blower means introducing air into the air inlet, passing the air through the first and second passages, and discharging the air through the air outlet,

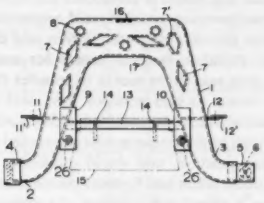
(d) the conduit including a heat exchanger box of relatively smaller height than width and depth, the box being provided with laterally spaced and enclosed slots extending therethrough and extending rearwardly to provide the first passage between the slots communicating with the air inlet, and to provide a pair of second passages laterally outward of the slots communicating with the air outlet, the slots terminating in spaced relation to the rear of the box to provide a transverse passage placing the first and second passages in communication.

4,103,670

FIREPLACE HEAT INTENSIFIER

Andrew Bergs, 3214 Clemenceau Blvd., Windsor, Ontario, Canada

Filed Apr. 18, 1977, Ser. No. 788,533
Int. Cl.[2] F24B 7/00
U.S. Cl. 126—121 **3 Claims**



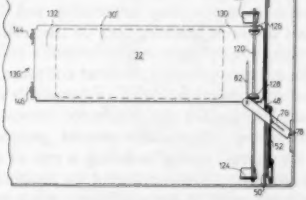
1. A heat intensifier insert into a fireplace comprising a U-shaped tube of rectangular cross-section having a somewhat straight rear section with a diverging arm extending from each end thereof, said arms terminating in short outwardly curved ends; a plurality of open end ducts located inside and in the rear and part way up the arms of said tube, said open duct ends terminating at the top and bottom of said tube; a casing containing a fan or blower therein for attaching to the end of one of said arms by tightly sliding part way into said arm; a louver attached to the end of the other arm of said tube by tightly sliding over said arm; said blower contained casing and said louver being interchangeable with respect to the arms to which they are attached; an extendable baffle located at each side of said tube for the purpose of enclosing any space between the tube and the opening of the fireplace into which it is inserted; a plate bent into an angle attached to each of said arms, the horizontal leg of which is flush with the top of said arm and extending outwardly to the inside of the "U," by means of which the said tube can be attached to said fireplace; a narrow baffle attached to the rear inside bottom edge of the tube and running part way along each arm to make contact with each of said extendable side baffles; and a narrow plate joining the insides of the two arms, for attaching thereto a comparatively wide baffle for preventing the escape of smoke from the fireplace into the room, when required.

4,103,671

WINDOW OVEN DOOR FOR SELF-CLEANING OVEN

David G. Smith, Weston, Canada, assignor to GSW Limited - GSW Limitee, Toronto, Canada

Filed Jan. 3, 1977, Ser. No. 756,119
Int. Cl.[2] F23M 7/00
U.S. Cl. 126—200 **20 Claims**



1. In an oven door having spaced apart outer and inner panels with aligned window openings and one or more transparent window panes, an apparatus for raising and lowering a shield to and from a position which covers and shields such transparent window pane in said outer panel from thermal radiation generated by an oven operating at high temperatures, said oven door being mounted on an oven by a hinge assembly

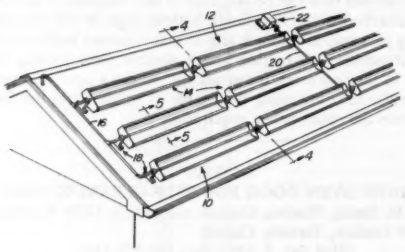
at each side of said door which enables said oven door to be raised from and lowered to an oven door open position, locking means for locking said oven door shut on an oven when said shield is raised to a window covering position, a drive means adapted for movement in said door relative to and along the door's height, the movement of said drive means being associated with the hinged movement of said door, a track system to which said shield is connected for movement to and from a window covering position, said apparatus comprising an actuator arm pivotally mounted within said door and connected to said shield, a fastener means for connecting said actuator arm with said drive means to transfer the movement of said drive means to said actuator arm, said actuator arm being in a position which places said shield in a window uncovered position with said fastener means connected and with said door in its open position, said shield remaining in a window uncovered position when said fastener means is unconnected as said oven door is raised and lowered, the arrangement being such that as said door is raised from its open position, with said fastener means connected, said actuator arm is swung upwardly relative to said door's height to raise said shield to its window covering position.

4,103,672

SOLAR COLLECTOR

Warren A. Meyer, 8612 Bellehaven Pl., N.E., Albuquerque, N. Mex. 87112

Filed May 21, 1976, Ser. No. 688,830
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 **11 Claims**



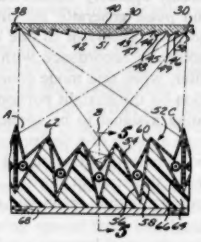
1. A solar collector, comprising, in combination:
(a) a heat collector;
(b) reflector means for directing radiation from the sun onto the heat collector;
(c) support means for mounting the heat collector and reflector means in cooperating relationship and for exerting opposed forces at spaced points on the reflector means and biasing the reflector means toward a parabolic contour focusing rays toward the head collector; and
(d) the reflector means including a substantially rectangular, normally substantially planar reflector element including a pair of spaced, substantially parallel, peripheral edges, with the support means including a pair of spaced, opposed attachment points engaging the peripheral edges of the reflector element, the attachment points being spaced from one another a distance less than a distance between the peripheral edges of the reflector element for biasing the reflector element toward the desired parabolic contour, the reflector means further including a resilient strip engaging the attachment points and partially overlying and abutting the reflector element for biasing the reflector element toward a parabolic contour.

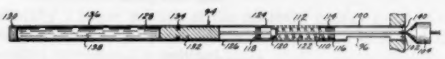
4,103,673

NON-TRACKING SOLAR ENERGY CONCENTRATOR

Robert N. Woodworth, 2838 Graysby St., San Pedro, Calif. 90732, and Ulf Brynjestad, 1047 W. Ashbridge La., Harbor City, Calif. 90710

Filed Dec. 6, 1976, Ser. No. 748,140
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 **6 Claims**





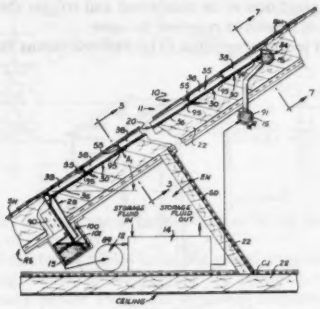
1. A solar energy concentrator comprising:
a lens element to receive incident solar energy and focus the received solar energy into a narrow, concentrated beam;
a plurality of parallel flow channels having inlet and outlet ends and in side-by-side relationhsip beneath said lens element and oriented with respect thereto for reception of said concentrated beam of solar energy on respective ones of said flow channels;
inlet cross header means in open communication to each of said flow channels to supply a heat exchange fluid to the inlet of said flow channels;
outlet cross header means in communciation through outlet valve port means with each of said flow channels to remove heated heat exchange fluid from the other said flow channels;
valve means in each of said flow channels including a tubular valve body having an open end received in said outlet cross header and positioned within its respective flow channel with inlet port means in the wall of said tubular member and valve seat means extending about the open end of each of said outlet port means, a valve closure member carried on a valve stem for movement between closed and open registration with said valve seat means;
a coaxial tubular spring housing received on the inboard end of said valve body and bearing an end plate and receiving said valve stem with the latter fixedly carrying a piston;
a helical coil spring received between said end plate and piston;
thermostatic actuator means supported within its respective flow channel and including a displaceable member moveably responsive to temperature changes experienced by said thermostatic actuator and moveable into an abutment position with the received end of said valve stem to effect relative movement of said closure member; and
adjustment means whereby the spacing between said displaceable member and the received end of said valve stem is adjustably variable to provide a controllable deadband in response of said valve closure member to temperature changes of said thermostatic actuator.

4,103,674

MODULAR SOLAR COLLECTOR SYSTEM

Glen P. Robinson, Jr., Atlanta; Samuel V. Shelton, Stone Mountain, and Samuel F. Hutchins, Lilburn, all of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 660,249, Feb. 23, 1976, Pat. No. 4,074,705. This application Dec. 2, 1976, Ser. No. 746,850
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 44 Claims



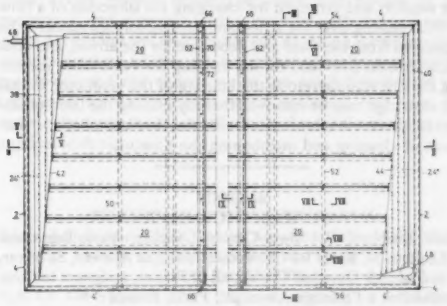
1. A modular solar collector system for installation on the spaced apart, generally parallel refters in a building to expose heat transfer fluid to solar radiation including a collector pan assembly adapted to fit in the opening between and be attached to the opposed inside edges of the adjacent building rafters said collector pan assembly defining a common fluid flow channel therein inclined with respect to the horizontal at a prescribed inclination angle so that the heat transfer fluid can flow down the fluid flow channel under the force of gravity, said collector pan assembly comprising a plurality of collector pans; each of said collector pans having an upstream end and a downstream end, and comprising a generally flat bottom wall over which the heat transfer fluid can flow in a thin fluid film and a pair of side walls along opposite sides of said bottom wall so that said side walls and said bottom wall define a pan fluid flow channel along the length of said collector pan; each of said side walls including a mounting leg flexibly movable with respect to said bottom wall; each of said collector pans having a transverse width such that said collector pan can be positioned in the opening between the building rafters and at least a portion of said mounting leg of each of said side walls can be forced into juxtaposition with one of the opposed inside edges of the adjacent building rafters and attached thereto to mount said collector pan within the opening between the building rafters, the upstream end of said collector pan having a prescribed exterior size and shape and the downstream end of said collection pan having a prescribed interior size and shape complimentary to said upstream exterior shape, said plurality of collector pans serially connected together with the downstream end of each of said collector pans overlapping the upstream end of another of said collector pans immediately downstream thereof with the downstream interior shape of each said collector pan complimentarily fitting over the upstream exterior shape of the next downstream said collector pan so that the pan fluid flow channels are serially connected to form said common fluid flow channel and to prevent leakage of said heat transfer fluid as said heat transfer fluid flows from the downstream end of each said collector pan onto the upstream end of the next downstream said collector pan.

4,103,675

SOLAR COLLECTORS

Benjamin Bar-On, 15 Hacarmel St., Rishon Lezion, and Eldad Paz, 9 Haysur St., Ramat Hasharon, both of Israel

Filed Jan. 31, 1977, Ser. No. 763,990
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 9 Claims



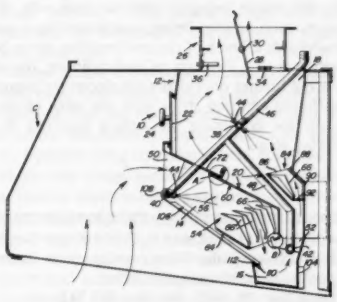
1. A solar collector comprising a housing having a window transparent to solar radiations, and an absorber panel disposed within the housing and having a solar-radiation-absorbing surface facing said window; said absorber panel including a main extrusion section integrally formed with a plurality of fluid-conducting channels extending in one direction through the panel for conducting a fluid to be heated by the solar radiations intercepted by the absober panel, and two end extrusions each integrally formed with a plurality of fluid-conducting channels extending at right angles to those of the main extrusion section, and each cut along a diagonal line through its respective plurality of channels, one end extrusion being joined along its diagonal cut line to one end of said main extrusion section and constituting the inlet manifold of the absorber panel, the other end extrusion being joined along its diagonal cut line to the opposite end of said main extrusion section and constituting the outlet manifold of the absorber panel.

4,103,676

GREASE EXTRACTION CARTRIDGE FOR KITCHEN EXHAUST VENTILATOR

Karl F. Kastner, 6025 Smokey Canyon Dr., Sun Valley, Nev. 89431

Filed Nov. 3, 1976, Ser. No. 738,359
Int. Cl.[2] F24C *15/20*
U.S. Cl. 126—299 E 4 Claims



1. In a kitchen exhaust ventilator including a housing divided into a first chamber, a second chamber, and a third chamber, with the three chambers being in serial communication with one another and defining a flow path through the housing passing from the first chamber through the second chamber

and into the third chamber, and a grease extraction system disposed for partially forming the flow path, the grease extraction system including a grease extraction cartridge removably mounted on the housing, the improvement wherein the grease extraction cartridge forms the flow path entirely through the first chamber of the housing, the cartridge comprising a common fire wall separating the first chamber and third chamber, and the cartridge including a support, an airfoil mounted on the support and arranged for changing the direction of a flow of fluid passing over the airfoil and causing foreign matter to be separated from the fluid and deposited on the airfoil, and connector means provided on the housing for removably mounting the fire wall thereto in the housing of the ventilator so that the cartridge may be removed thereby placing the third chamber in direct communication with the first chamber for purposes of cleaning and maintaining the housing.

4,103,677

ULTRASONIC CAMERA

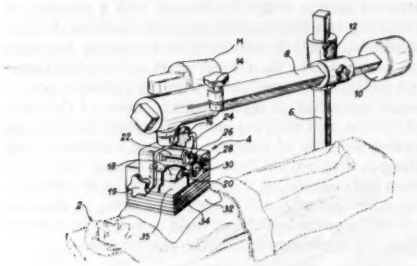
Alain Lansiart, Gif; Jean-Claude Gaucher, Versailles; Jean Lequais, St. Remy les Chevreuse; Jean-Luc Moretti, St-Maur, and Annick Quettier, Creteil, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 16, 1976, Ser. No. 742,234

Claims priority, application France, Nov. 24, 1975, 75 35817

Int. Cl.[2] A61B *10/00*

U.S. Cl. 128—2 V **9 Claims**



1. An ultrasonic camera comprising an emitting section and a receiving section which are both located on the inner surface of a portion of a cyliner, the receiving section being constituted by a plurality of n receiving elements in the form of strips disposed in parallel relation and the emitting section being constituted by a plurality of m emitters which are also in the form of parallel strips, the strips of the emitter are disposed in two groups, each group being constituted by a band of parallel strips and the two bands being located on each side of the receiving section, each emitter being constituted by a pair of strips, the parallel side of each of the two emitting strips being such as to form part of a directrix of said cylinder, the ultrasonic camera being further provided with electronic means for exciting the different emitting strips with the same phase and electronic means for collecting the signals received by the different receiving strips.

4,103,678

NOCTURNAL PENILE TUMESCENSE MONITOR

Ismet Karacan, Houston, Tex.; Larry G. Paulson, and Gerald W. Timm, both of Minneapolis, Minn., assignors to American Medical Systems, Inc., Minneapolis, Minn.

Filed Apr. 21, 1977, Ser. No. 789,713

Int. Cl.[2] A61B *5/00;* **G01D** *15/10*

U.S. Cl. 128—2.05 V **19 Claims**

1. Apparatus for simultaneously monitoring electrical signals from two, separate sensing devices and recording same on a single, multiplexing strip chart recorder, comprising:

a strip chart recorder comprising:

a movable pen disposed in trace producing relation to heat sensitive recording paper;

a motor drivingly connected to said pen;

a heater on said pen;

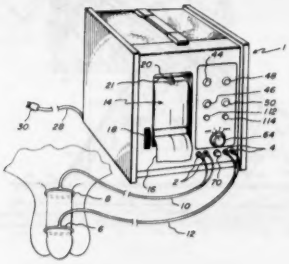
drive means for advancing said recording paper past said pen at a predetermined speed;

electrical circuit means connecting said pen motor and said pen heater to a power source and comprising:

switch means interconnected to said pen motor for transmitting drive signals thereto;

two separate sensing devices connected to said switch means, said sensing devices being selectively positionable at different monitoring locations to detect changes in a condition to be monitored and trigger the generation of signals in response to same;

control means connected to said switch means and operative to emit control signals at predetermined time intervals to condition said switch means to receive input signals alternately from said two sensing devices at predetermined time intervals, and said switch means transmitting said input signals alternately from said two sensing devices to said pen motor, whereby said motor actuates said pen so as to record two separate traces on said recording paper corresponding to respective ones of said input signals from said two sensing devices; and



signal relaying means connected between said control means and said pen heater and operative to selectively transmit an energizing signal to said pen heater in response to control signals from said control means in synchronization with the alternate conditioning of said switch means, at such frequency that said pen heater is de-energized during switching excursions of said pen between said two traces.

4,103,679

METHOD AND APPARATUS FOR MEASURING BLOOD FLOW NONINVASIVELY

Harmon J. Aronson, Wayne, N.J., assignor to Biosonics, Inc., Wayne, N.J.

Filed Mar. 22, 1977, Ser. No. 780,078

Int. Cl.[2] A61B *5/02*

U.S. Cl. 128—2.05 F **26 Claims**

18. An apparatus for noninvasively measuring rate of volumetric blood flow and velocity profile in a vessel in a section of a living body comprising;

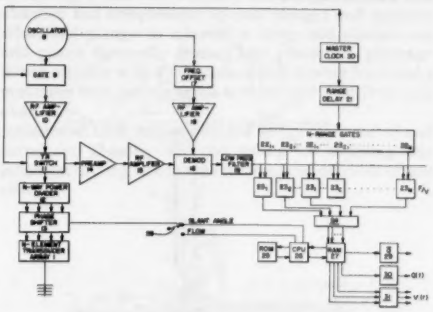
(a) electronic means including transmitting means located outside of the body for noninvasively transmitting beams of pulsed ultrasonic energy in the direction of the vessel at different angles relative to the direction of fluid flow;

(b) said electronic means including receiving means for receiving the ultrasonic energy backscattered by the flowing blood at the different angular orientations of said beams;

(c) said electronic means including means for measuring the different frequency shifts of the received ultrasonic energy corresponding to said beams of pulsed ultrasonic energy transmitted at said different angular orientations;

(d) said electronic means including stored program and computing means for calculating one of the angles at which the ultrasonic beam intercepts the blood flow;

(e) said electronic means including means for measuring the frequency shifts between the transmitted and received ultrasonic wave energy backscattered at said one of the



angles at incremental radial positions along the cross-section of the vessel; and

(f) said electronic means including stored program and computing means for calculating the blood flow rate and velocity profile from said measured frequency shifts at said radial positions along the cross-section of the vessel and from the previously calculated said one of the angles

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4,103,680

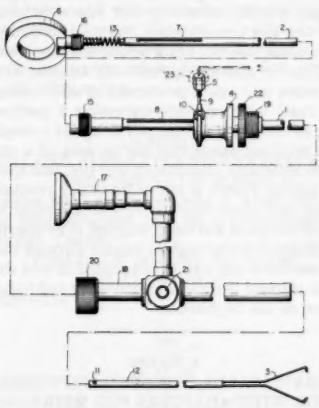
MULTIPLE OCCLUSION RING APPLICATOR AND METHOD

In Bae Yoon, 2213 Forest Ridge Rd., Timonium, Md. 21093

Continuation-in-part of Ser. No. 605,217, Aug. 15, 1975, which is a continuation-in-part of Ser. No. 518,617, Oct. 29, 1974, Pat. No. 3,989,049, which is a division of Ser. No. 383,475, Jul. 30, 1973, Pat. No. 3,870,048. This application Aug. 15, 1975, Ser. No. 605,197

Int. Cl.[2] A61B *17/12, 17/22*

U.S. Cl. 128—6 **25 Claims**



1. An instrument for applying multiple elastic occluding rings to anatomical tubular structures without the necessity of reloading the instrument which comprises a ring applicator device combined with an endoscope, said ring applicator device comprising an inner cylinder and an outer cylinder, said inner cylinder being slidably disposed within said outer cylinder, forceps means slidably disposed within said inner cylinder and operating slide means operatively associated with the forceps means and the inner and outer cylinders for sequentially displacing the forceps means in the proximal direction relative to the inner and outer cylinders and for displacing the forceps means and inner cylinder in the proximal direction relative to the outer cylinder as the result of a single movement of said operating slide means toward the proximal end of the instrument, said ring applicator device being combined with said endoscope so that the distal end portion of the ring applicator device extends beyond the distal end portion of the endoscope, and engaging means provided with the ring applicator device and the endoscope, said engaging means cooperating to produce relative movement between the ring applicator device and the endoscope in the axial direction of the instrument for displacing an elastic occluding ring from the outer cylinder to the inner cylinder at the distal end of the ring applicator device.

4,103,681

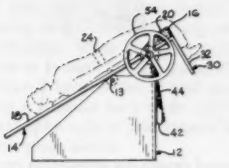
TILTING TRACTION APPARATUS

Bernard J. Shanley, 1241 Garden Ave., Roseville, Minn. 55113

Filed Sep. 10, 1976, Ser. No. 721,977

Int. Cl.[2] A61F *5/00*

U.S. Cl. 128—71 **9 Claims**



1. A tilting therapeutic traction table comprising:

(a) a base;

(b) a body support platform having first and second ends and a broad upper surface extending continuously between said first and said second ends and of a width sufficiently large to fully support the upper leg and torso portion of a human body, said platform being adapted for supporting a patient such that the head of a patient is disposed adjacent said first end and the legs of the patient from his knees downward hang freely over said second end of said platform, said platform being configured to further define a ramp-like surface disposed adjacent said second end of said platform, said surface being inclined upwardly in the direction from said first to said second ends and adapted to elevate the knees of a patient supported thereby above the general plane of said platform while fully supporting the thigh portion of the patient's legs, in a manner which contains the buttocks of the patient in engagement with said platform;

(c) hinge means for pivotally connecting said platform to said base, said hinge means being mounted intermediate said first end and said second ends of said platform;

(d) power transmission means suitable for direct operation by a patient lying on said platform, for tilting said platform about said hinge means to a degree proportional to the actuation input stimulus provided by the patient to the transmission means, said transmission means being operable to cause said first end of said platform to move downward while said second end of said platform moves upward and in a manner such that said first end of said platform is disposed increasingly relatively lower than said second end of said platform; and

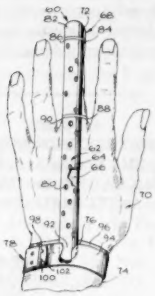
(e) restraining means adapted for engaging the hip portion of a patient lying on said platform for preventing movement of the patient against longitudinal translation of the patient along said platform in the direction from said second to said first end thereof when said platform is tilted.

4,103,682

ANATOMICAL DIGIT AND APPENDAGE-IMMOBILIZING DEVICE

Gertrude K. Franzl, 105-25 65th Ave., Forest Hills, New York, N.Y. 11375

Filed Sep. 20, 1976, Ser. No. 724,713
Int. Cl.[2] A61F *5/04*
U.S. Cl. 128—87 A **2 Claims**



1. An improved device for supporting one or more fingers, said device comprising, in combination:

a. at least one generally rigid elongated mold adapted to generally conform to a major surface of at least one digit and extending along the length of said digit over both finger joints and terminating at and overlying the wrist;

b. a wrist securing means including a composite band adapted to encircle the wrist;

c. a non-allergenic layer of material secured to the underside of said mold;

d. said mold and said layer having a plurality of aligned openings therein;

e. a non-allergenic layer secured to the underside of said composite band;

f. said composite band having an inner band portion and an outer band portion constructed so as to form a pocket therein;

g. adjustable fastening means secured to both ends of said composite band;

h. said composite band being adapted to selectively receive and frictionally, releasably retain one end of one or more of said molds therein;

i. said adjustable fastening means adapted to be adjusted to accommodate within said pocket the ends of varying numbers of molds and further adapted to be tightened to frictionally and releasably retain said ends within the pocket of the composite band;

j. said mold having a first groove disposed in the upper end thereof extending in a transverse direction to the length of the mold and at a location overlying the portion of a finger extending past the outermost finger joint;

k. a first elastic band member;

l. said first elastic band member adapted to be disposed within said first groove and encircle both said mold and the portion of a finger lying thereunder;

m. said first groove adapted to maintain said first elastic band member in a firxed position with respect to said finger; and,

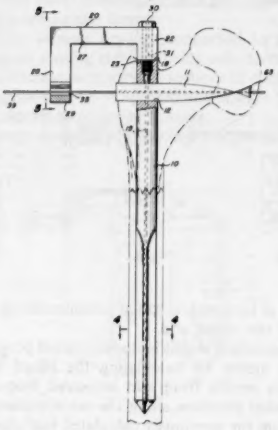
n. whereby said molds can readily be removed from said pocket by selectively sliding them out of said pocket.

4,103,683

SUB-TROCHANTERIC NAIL

John A. Neufeld, 10,000 SE. Main, Suite 402, Portland, Oreg. 97216

Filed Jun. 3, 1977, Ser. No. 803,347
Int. Cl.[2] A61F *5/04;* A61B *17/18*
U.S. Cl. 128—92 BA **10 Claims**



1. A sub-trochanteric fracture appliance for use in a surgical procedure for stabilizing the trochanter and distal portions of a fractured upper thighbone, the appliance including a crosspiece that may be assembled in combination with a universal right and left handed femoral nail, the nail being adapted for insertion in the medullary canal of the thighbone to extend from the trochanter into the distal portion of the bone and the crosspiece extending across the trochanter and into the neck and femoral head thereof, comprising a cylindrical femoral nail adapted to be inserted to extend for a substantial distance from the greater trochanter through the medullary canal into a distal portion of a fractured thighbone, said femoral nail having a narrow longitudinally extending slot near one end thereof defined by top and bottom walls and longitudinally aligned arcuate side walls, said slot being positioned lengthwise of said femoral nail to be situated opposite the femoral head of the thighbone when said nail is positioned in said trochanter and medullary canal with said slot traversing a portion of said trochanter, an elongated flat spirally designed crosspiece having a cross sectional shape that has an area of a size to just neatly fill the open area constituting said slot, said spiral of said crosspiece having a pitch in the order of one revolution in an 8-inch length, said crosspiece having a length equal to about ¼ a full twist of the spiral and being adapted to be inserted in said slot to be driven therethrough to extend through the neck of the femur and have one end firmly seated in said slot and its other end positioned generally horizontally and lodged in the femoral head of the thighbone.

4,103,684

HYDRAULICALLY POWERED HYPODERMIC INJECTOR WITH ADAPTERS FOR REDUCING AND INCREASING FLUID INJECTION FORCE

Aaron Ismach, 200 Upper College Ter., Frederick, Md. 21701

Filed Dec. 30, 1976, Ser. No. 755,475
Int. Cl.[2] A61M *5/30*
U.S. Cl. 128—173 H **4 Claims**

1. A hypodermic jet injection device comprising:

a barrel having a chamber adjacent one end thereof for containing a quantity of fluid to be discharged;

a reciprocatable piston in said chamber for discharging said fluid under pressure;

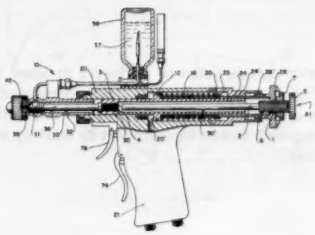
a reciprocatable hollow plunger in said barrel secured to said piston;

first trigger means arranged to initiate hydraulic retraction and retention of said plunger;

second trigger means arranged to release hydraulic retention of said plunger;

a coil spring in said barrel biasing said plunger toward said chamber and compressible by said plunger and operable when said plunger is released to drive said plunger and said piston forwardly toward said chamber a predetermined distance with a maximum initial driving force and a minimum final driving force to eject said fluid from said chamber;

an adjustment knob means mounted on the other end of said barrel and abutting said coil spring for adjusting said minimum driving force at the forward end of travel of said piston;



an adapter assembly means removably mountable on said adjustment knob and comprising means for varying said maximum initial driving force,

said assembly comprising;

a housing detachably mounted to said adjustment knob means;

a shaft slidably mounted in said housing and extending from said housing coaxially said spring and said hollow plunger; said shaft terminating within said hollow plunger adjacent the point where said piston is secured to said plunger;

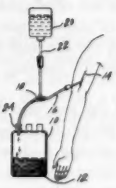
another spring in said housing axially aligned with said first named spring and operatively biasing said shaft towards said hollow plunger so that retraction of said shaft by said plunger, with respect to said adjustment knob means, simultaneously compresses both the first named spring and said other spring.

4,103,685

METHOD AND APPARATUS FOR EXTRAVASCULAR TREATMENT OF BLOOD

Paul J. Lupien, 686 Le Cavalier; John A. Awad, 632 Ave. Charron, and Sital Moorjani, 2905 De la Providence, all of Ste-Foy, Quebec, Canada

Filed Jan. 5, 1976, Ser. No. 646,567
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—214 R **14 Claims**



1. A method for the extracorporeal treatment of the blood of a patient afflicted with hyperlipemia and/or hypercholesteremia to effect a reduction of the β and pre-β lipoproteins in said blood without substantially affecting the remaining constituents of the blood, which comprises:

(a) withdrawing a portion of blood from said patient,

(b) contacting said blood portion with a water-insoluble gel of a sulfated polysaccharide coupled to an activated non-sulfated polysaccharide having its remaining sites blocked, in the presence of calcium cation in a concentration of 0.02 to 0.04M, thereby selectively binding a substantial portion of the beta and pre-beta lipoproteins with the calcium complex gel,

(c) causing the thus treated blood portion to be filtered, thereby to separate the treated blood portion from the complex gel, whereby there is obtained the same blood portion wherein the initial amount of beta and pre-beta lipoproteins has been substantially reduced without affecting the remaining constituents of the blood, and

(d) returning the thus filtered blood portion to the patient.

5. In an apparatus for removing a substantial amount of β0 and pre-β lipoproteins from blood comprising recipient means for receiving therein blood to be treated; means allowing the removal of treated blood from said recipient means; and filter means disposed between said gel support and said means allowing treated blood removal, the improvement comprising a calcium metallic complex of sulfated polysaccharide coupled to an activated non-sulfated polysaccharide gel support wherein the remaining sites are blocked being contained in said recipient means whereby, when in the presence of said gel support, said blood is treated by the fixing of a substantial amount of β and pre-β lipoproteins to said support and said filter means having a porosity such as to prevent passage of said gel support therethrough as said treated blood is withdrawn from said recipient means.

4,103,686

DUAL VALVE ASSEMBLY

Robert J. LeFevre, Bethlehem, Pa., assignor to Burron Medical Products, Inc., Bethlehem, Pa.

Filed Mar. 29, 1977, Ser. No. 782,411
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—214 R **10 Claims**

1. A dual valve assembly for use in intravenous administration from multiple parenteral fluid sources, said valve assembly controlling flow of fluid in forward and reverse directions therethrough, comprises a valve body having an inlet and an outlet and defining first and second spaced apart valve chambers therein, a first valve member is movable in the first valve chamber between a valve seat and a valve stop, a second valve member is movable in the second valve chamber between spaced opposed valve seats, and means extends between the first valve member and the second valve member to engage the second valve member and move it from one of its seats in

response to movement of the first valve member from its seat, whereby flow is enabled from the inlet to the outlet, said second valve member being movable by fluid pressure into closing engagement with the other of its seats in response to flow from the outlet toward the inlet to preclude reverse flow through the assembly.

4,103,687

USE OF HAPTOGLOBIN FOR THERAPY OF CEREBRAL VASOSPASM

Shozo Ishii, Tokyo, Japan, assignor to The Green Cross Corporation, Osaka, Japan

Filed Jul. 20, 1976, Ser. No. 707,069
Claims priority, application Japan, Apr. 16, 1976, 51-43100
Int. Cl.[2] A61M *5/00*; A61K *29/00*
U.S. Cl. 128—214 R **12 Claims**

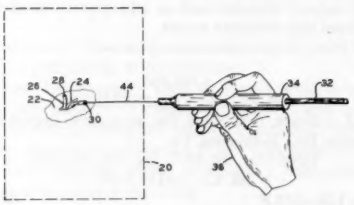
1. A method of releasing and remedying human cerebral vasospasm comprising administering to a spastic cerebral artery haptoglobin or haptoglobin-hemoglobin complex in an amount sufficient for such purpose.

4,103,688

METHOD AND APPARATUS FOR STERILIZATION

John Edwards, Rte. 1, County Rd. 550 S., Churubusco, Ind. 46723

Filed Apr. 29, 1976, Ser. No. 681,401
Int. Cl.[2] A61B *17/36*
U.S. Cl. 128—303.17 **8 Claims**



1. A vas deferens cauterizing instrument for use with an energy source comprising:

a flexible, non-resilient, pliable, filamentar elongate electrode of a size to be slidably inserted within a vas deferens and capable of being retentively configured to conform to the shape of the vas deferens having an exposed cauterizing tip of predetermined length at one end;

a conductive connecting member secured to the other end of said electrode and in electrical contact therewith, and adapted to be removably received in electrical engagement with the energy source;

a thin, flexible, lubricous, dielectric covering on said electrode along its length from said member to said exposed cauterizing tip for low friction sliding engagement with the inner walls of the vas deferens; and

said cauterizing tip being electrically exposed to transmit energy directly to the inner walls of said vas deferens to cause cauterization and resultant sealing thereof on withdrawal of the tip from the vas deferens.

4,103,689

TISSUE PRESSURE REFERENCE FOR CEREBROSPINAL FLUID SHUNTING DEVICE

Stephen Beecher Leighton, 93 Jefferson Ave., Maplewood, N.J. 07040

Filed Dec. 13, 1976, Ser. No. 750,154
Int. Cl.[2] A61M *27/00*
U.S. Cl. 128—350 V **5 Claims**

1. A hydrocephalus shunt system comprising an inlet tube for connection to the ventricles of the brain, and an outlet tube for connection to a body cavity downstream, and interposed there between a pressure regulating collapsible tube, the improvement wherein said collapsible tube consists of an annular walled structure of compliant material having closely juxtaposed sides such that in the relaxed position of zero transmural pressure, the lumen of the tube has a substantially closed cross-section and wherein the collapsible section is substantially free

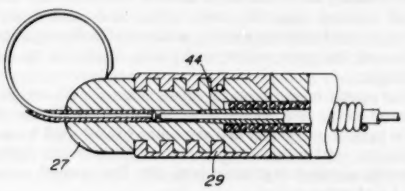
of a case or compartment or enclosure or inner wall spacing means of any kind and wherein intimate contact of the collapsible section with body tissue is maintained said collapsible tube being connected to and supported at its ends by said inlet and outlet tubes.

4,103,690

SELF-SUTURING CARDIAC PACER LEAD

Donald Leal Harris, Miami Beach, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Mar. 21, 1977, Ser. No. 779,686
Int. Cl.[2] A61N *1/04*
U.S. Cl. 128—418 **6 Claims**



1. A cardiac pacer lead comprising:

an electrical terminal;

a tip for contacting cardiac tissue;

flexible conductor means extending between said terminal and said tip;

a length of formable wire;

a tubular die mounted at the tip end of said lead, said die having a central bore which receives said formable wire, said die having, at the distal end thereof, means for deflecting said wire out of alignment with said bore to impart a curvature of predetermined radius to said wire as it is driven through the die, said length of wire being provided with means for limiting the passage of said wire through the die,

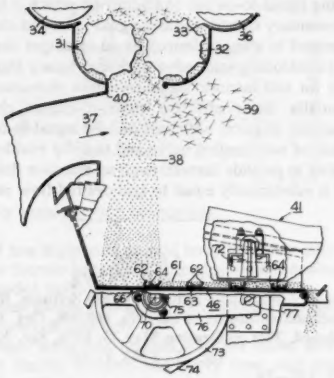
said terminal, said tip and said flexible conductor means being hollow to permit the passage therethrough of elongate means for driving said wire through the die, said elongate means being operable from the terminal end of said lead, whereby said tip may be secured to cardiac tissue ejecting said length of wire through said die while said tip contacts cardiac tissue, the wire passing through the tissue in a curved path which arches back toward the tip effectively forming a suture holding the tip in place.

4,103,691

COMBINE WITH MEANS FOR REDUCING THE BOUNCE OF ACCELERATED GRAIN

J. Lyle Shaver, Blue Springs, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 592,713, Jul. 2, 1975, Pat. No. 4,007,744. This application Aug. 11, 1976, Ser. No. 713,536
Int. Cl.[2] A01F *12/00*
U.S. Cl. 130—24 3 Claims



1. In a combine including a threshing cylinder, the combination comprising:

accelerator means receiving a mixture of threshed grain and chaff from said threshing cylinder and accelerating said grain and chaff downwardly;

means supplying a horizontal stream of air intersecting said grain and chaff accelerated downwardly by said accelerator means, said air stream carrying the chaff horizontally out of said downwardly accelerated grain; and

a horizontally disposed grain pan supported on said combine for horizontal oscillation, said grain pan being disposed beneath said accelerator means at a level below said air stream and in receiving relation to said grain accelerated downwardly by said accelerator means through said air stream, said grain pan including a substantially flat bottom and a plurality of horizontally spaced baffles extending upwardly and horizontally, in the direction of said air movement, from said bottom of said grain pan to a height sufficient to retain a layer of grain on the bottom of said grain pan during oscillation thereof, said layer of grain serving to absorb the impact of the grain accelerated downwardly by said accelerator means.

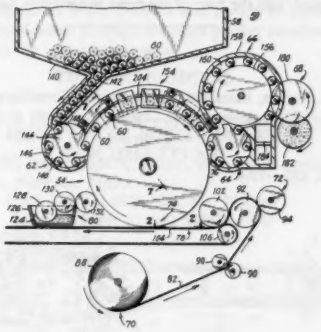
4,103,692

CIGAR WRAPPING MACHINE AND METHOD

Robert J. Baier, West Chester; Vern Anderson, Berwick, and William S. Aseltine, Devon, all of Pa., assignors to Gulf & Western Corporation, New York, N.Y.

Filed Jul. 21, 1977, Ser. No. 808,919
Int. Cl.[2] A24C *1/30*
U.S. Cl. 131—32 37 Claims

1. A machine for spirally applying wrappers to cigar bunches said machine including means for supplying bunches having fire ends and tapered mouth ends; means for supplying elongated wrappers having flag ends; a continuously moving bunch carrier; a continuously moving wrapper carrier; means for applying bunches to the bunch carrier spaced apart in the direction of movement of the bunch carrier and with their longitudinal axes perpendicular to said direction of movement; means for applying wrappers to the wrapper carrier spaced apart in the direction of movement of the wrapper carrier, with their longitudinal axes at the same acute angle to the direction of travel of the wrapper carrier and with the tip of each wrapper foremost; each of said carriers having a different predetermined path of travel; the paths of travel of said bunch carrier and of said wrapper carrier having common portions that are coextensive; the paths of travel of said bunch carrier and of said wrapper carrier approaching each other as they approach the coextensive common portions and the tip of each wrapper reaching the common portion before the balance of such wrapper; the tip of each wrapper being brought into contact with the fire end of an associated bunch as the bunch and wrapper reach the common portions; means to apply paste to the tip of each wrapper before the wrapper reaches the common portions so that said tip will adhere to the bunch when the tip is applied to the bunch; means to spin the bunches as they traverse the common portions while the bunches are bodily moving through the common portions in a direction perpendicular to their lengths; means to move each wrapper relative to its



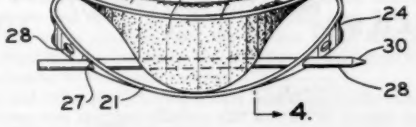
associated bunch at such a speed that the wrapper is spirally applied to the spinning bunch; suction means to hold the wrapper to the wrapper carrier as it is being applied; flag carriers on the wrapper carrier, each flag carrier being disposed to receive the flag end of a different wrapper supported on the wrapper carrier; and means to move the flag carrier relative to the wrapper carrier in a fore and aft direction and in an inboard/-outboard direction, and to angularly rotate the flag carrier to apply the flag to the tapered mouth end of the associated bunch being wrapped in such a manner as nicely to apply the flag to the mouth end of the bunch in conformance with the configuration of said end, whereby the flag-ended wrappers are spirally wrapped about the bunches while moving the bunches and wrappers continuously from a point of application of the bunches and wrappers to their respective carriers to a point of delivery spaced from the point of application.

4,103,693

HAIR ARRANGING ACCESSORY

Rose M. Reagan, 1550 E. 221st St., Euclid, Ohio 44117

Filed Mar. 3, 1977, Ser. No. 774,150
Int. Cl.[2] A45D *8/00*
U.S. Cl. 132—46 R 10 Claims



1. A hair arranging accessory for securing a strand of hair gathered together at a predetermined location on the head and providing a base for a hairpiece, said accessory comprising:

a substantially flattened annulus, said annulus having substantially flattened front and rear semirigid wall portions

at least partly overlapping each other and of similar slight initial predetermined concavity;

said wall portions being connected to each other at laterally disposed rounded ends;

said accessory adapted to be disposed against the head with said rear wall portion positioned adjacent to the head and an intermediate portion of said front wall portion positioned outwardly and generally downwardly offset with respect to said rear wall portion;

said front and rear wall portions being sufficiently flexible whereby they can be flexed apart to define an opening for projecting the strand therethrough prior to disposing the rear wall portion against the head;

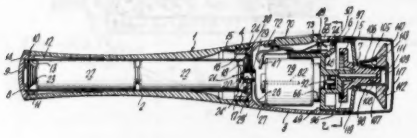
said front wall portion having a pair of apertures spaced inwardly of the ends thereof; and

an elongated pin projectable through said apertures, said strand, and the hair of the head to securely fasten the hair.

4,103,694
MANICURING UNIT

Paul D. Burian, Elmsford, and Arthur T. Sempliner, New York, both of N.Y., assignors to Clairol, Inc., New York, N.Y.

Filed May 6, 1976, Ser. No. 683,854
Int. Cl.[2] A45D *29/05*
U.S. Cl. 132—73.6 **14 Claims**



1. A portable manicure unit comprising

(a) a battery source,

(b) a battery-driven motor,

(c) a gear-reduction train and

(d) a manicuring tool rotatably driven by said motor via said gear-reduction train,

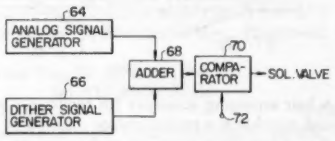
(e) said manicuring tool having an abrading working surface having a diameter of at least 0.75 inches and not substantially exceeding 1.5 inches, and

(f) said motor and said gear reduction train being correlated with the diameter of said manicuring tool to provide said working surface speed not substantially exceeding 30 inches per second, whereby said manicuring unit with said large-diameter, low-speed working surface is easily controlled and capable of use in self-manicuring while avoiding undesirable consequences, such as scalloping.

4,103,695
METHOD OF AND DEVICE FOR CONTROLLING SOLENOID OPERATED FLOW CONTROL MEANS

Shigeo Aono, Seki, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Nov. 5, 1975, Ser. No. 629,094
Claims priority, application Japan, Nov. 6, 1974, 49/127654; Mar. 7, 1975, 50/26962
Int. Cl.[2] F16K *31/06*; F02M *7/12*
U.S. Cl. 137—1 **8 Claims**

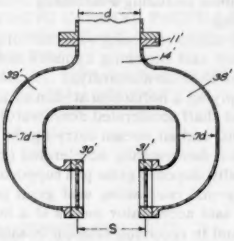


1. A method of controlling a solenoid-operated fluid flow control valve having a non-linear intrinsic signal-to-output characteristic, comprising (1) producing an analog basic signal representative of a desired flow rate of fluid through said control valve, (2) producing a steady-state dither signal having a predetermined oscillation frequency, (3) modifying said basic signal with said dither signal for producing a binary control signal digitally representative of a modified version of said basic signal, said dither signal having a waveform which is selected so that said control signal provides a non-linear compensating signal-to-output characteristic which is substantially complementary to said intrinsic signal-to-output characteristic with respect to a linear desired signal-to-output characteristic, and (4) controlling said valve with said binary signal to compensate for said intrinsic signal-to-output characteristic into a substantially linear effective signal-to-output characteristic substantially identical with said desired signal-to-output characteristic of said control valve and thereby enabling the control valve to provide therethrough an effective fluid flow rate which is substantially equal to said desired flow rate.

4,103,696
CONTROL VALVE

Francis H. Cary, Apple Hill Dr., North Scituate, R.I. 02857

Continuation-in-part of Ser. No. 408,096, Oct. 19, 1973, abandoned. This application May 19, 1976, Ser. No. 687,924
Int. Cl.[2] F16K *47/00*
U.S. Cl. 137—14 **4 Claims**



1. The method of controlling dissipation of liquid pressure energy in liquid flowing as a stream comprising the steps of separating the stream into only two symmetrical flow paths, placing at the end of each flow path a single variable orifice which form at the end of each path matched jets having equal cross-sectional area, spacing the orifices apart a distance whereby the vena contracta of each is spaced apart, directing each jet toward the other into an unobstructed liquid filled space between the two orifices and effecting a stable dissipation zone between the two vena contractas and discharging the flow of the said unobstructed space with substantially spherical expansion.

3. A valve assembly for dissipating pressure in a liquid comprising two variable orifices, an orifice actuating means mounted at the ends of symmetrical flow paths, said orifices axially facing one another in a liquid filled space, having equal cross-sectional area and spaced apart substantially within the range of -5% to $+30\%$ of a distance S defined by the expression

$$[1.3 + 0.1\sqrt[3]{\Delta P}]d$$

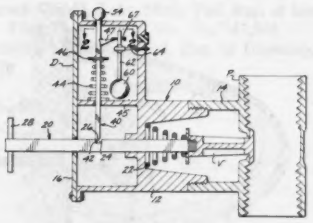
where ΔP equals the maximum design dissipation pressure and d is the flow path diameter, said orifices directing jets at each other in an unobstructed liquid filled space and being spaced apart a distance to create a stable dissipation zone therebetween, the flow discharging from the said zone with substantially spherical expansion.

4,103,697

SAFETY SENSOR DEVICE

Herbert L. Kiesow, 3251 E. Artesia, Long Beach, Calif. 90805

Filed Apr. 22, 1977, Ser. No. 789,783
Int. Cl.[2] F16K *17/36;* H01H *35/02*
U.S. Cl. 137—45 7 Claims



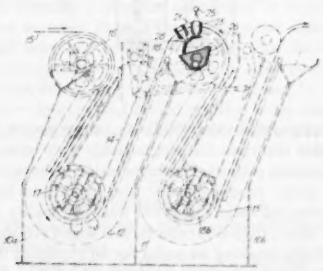
1. A safety sensor device, comprising:
a body;
a shut off arm supported on said body for linear movement relative thereto between a normal retracted position and an extended operative position;
spring means biasing said arm towards its operative position;
a stop formed on said arm;
a latch finger supported on said body for linear movement relative thereto towards and away from said arm, said latch finger having a latch surface engageable with said stop to normally retain said arm in its retracted position;
second spring means biasing said latch finger away from said arm;
a pendulum secured to one end of a rod that is secured to said body;
a post supported by said rod; and
a pad carried by said latch, said pad including a triangular surface that tapers towards said post with said post normally overlapping said triangular surface to prevent movement of said latch finger away from said arm, and with movement of said pendulum relative to said body causing said post to be moved out of the path of said pad whereby said latch finger will move away from said arm and the latter will be urged to its operative position.

4,103,698

BOTTLE LABEL REMOVING DEVICE

Bruce E. Richardson, and Rudy Oetliker, both of London, Canada, assignors to Labatt Breweries of Canada Limited, London, Canada

Filed Jun. 29, 1977, Ser. No. 828,282
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—73 7 Claims



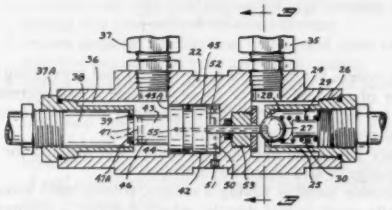
1. In a bottle soaking apparatus comprising a pocket conveyor having an endless chain of spaced bottle receiving pocket members moveable along an endless patch, each of said pocket members including an open-ended tubular element adpated to support a bottle in inverted position by engagement with the bottle shoulder, wheel means defining a portion of said endless path wherein said pocket members pass successively along a downwardly inclined run and thence upwardly about a lower direction changing wheel in a soaking compartment and thence downwardly about an upper direction changing wheel into a subsequent soaking compartment, said pocket members being in a generally inverted position as they travel over said upper direction changing wheel, the improvement comprising rinsing means for discharging downwardly directed sprays of a rinsing solution onto said bottles to flush off labels as they travel over said upper direction changing wheel, fluid collecting and discharging means positioned below said pocket members and sprays to collect rinsing solution and labels and cam means for engaging the mouths of the inverted bottles and lifting the bottle shoulders out of engagement with the pocket members while beneath said sprays to permit passage of the freed labels through the open pocket member lower ends and into the collecting means.

4,103,699

FLUID CYLINDER MOUNTED LOCK OUT VALVE DEVICE

Albam M. Vik, New Brighton, Minn., assignor to Avon Enterprises, Inc., Melrose, Minn.

Filed Jul. 16, 1976, Ser. No. 705,949
Int. Cl.[2] F15B *13/042;* G05D *7/00*
U.S. Cl. 137—106 2 Claims



1. A lock out valve assembly for controlling fluid flow to and from a hydraulic jack cylinder which comprises
(a) an elongated valve body having a passageway extending longitudinally therethrough,
(b) rigid conduit means for connecting the ends of the said passageway to opposite ends of a jack cylinder,
(c) the passageway including first and second chambers opening one to each of said conduit means and being separated by a spool chamber,
(d) first and second port means for connecting fluid lines respectively to said first and second chambers,
(e) a cylindrical valve spool slidably disposed in the spool chamber with its end faces open one to each of said first and second chambers,
(f) a ball check valve in the first chamber between the conduit means and first port means to check the flow from the end of a cylinder to which it is connected,
(g) a valve in the second chamber between the conduit means and second port means permitting open flow of fluid under pressure from the conduit means into the chamber but substantially blocking flow of fluid from the chamber to the conduit means,
(h) said valve spool having a stem extending axially therefrom into the first chamber and adapted to engage and unseat the ball check valve when fluid pressure is applied to the end face of the spool open to the second chamber,
(i) said spool and stem having a small orifice extending axially therethrough to provide limited open communication between the first and second chambers, and
(j) the ball check valve closing the end of the orifice in the

stem when the stem is in unseating engagement with the check valve.

4,103,700

AVIATION FUEL GRADE MONITOR

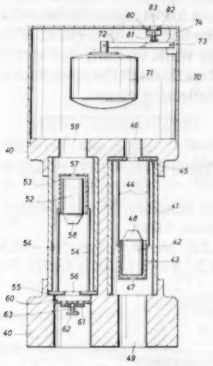
Leonard Orrell, Warrington, and John Whittle, Upton, both of England, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 3, 1977, Ser. No. 773,997

Claims priority, application United Kingdom, Mar. 16, 1976, 10504/76

Int. Cl.[2] F16K *31/28*

U.S. Cl. 137—172 **6 Claims**



1. A system for monitoring the density and preventing the passage of a liquid with a density outside a predetermined range having at least two parts arranged in a substantially vertical manner where each part comprises:

a body having an inlet and an outlet, and adapted for the passage of said liquid therethrough; and

a movable member having a weight/volume ratio substantially equal to said density, which member is adapted to move freely within said body between its outlet and its inlet, and is also adapted sealingly to engage with said outlet;

where the outlet of the first part communicates with the inlet of the second part, whereby a flow of liquid is made to pass through the substantially vertically placed parts in such a manner that the flowing liquid passes upwardly through one and downwardly through the other part, while the movable member in the one part will close off its outlet when the density of the flowing liquid increases beyond the predetermined range and the movable member in the other part will close off its outlet when the density of the flowing liquid decreases beyond the predetermined range.

4,103,701

FREEZE-PROOF CAP FOR OUTDOOR FAUCET

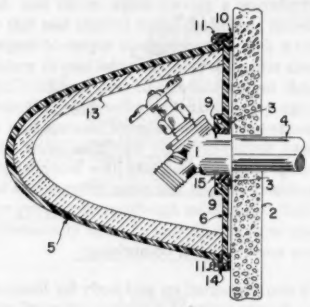
Duen-Ren Jeng, 5334 Fredelia Dr., Toledo, Ohio 43623

Filed Jul. 29, 1977, Ser. No. 820,346

Int. Cl.[2] F16K *51/00*

U.S. Cl. 137—375 **2 Claims**

1. A thermally insulated cap for protecting the outdoor faucets and the like from freezing and to reduce the heat leakage from a building through the space between a wall and a pipe line, comprising a thermally insulated cap section and a face plate providing means for rigidly mounting the said cap to an existing outdoor faucet adjacent to a wall, the cap integral formed with a rigid shell, preferably of hemi-spherical in shape, being made of PVC or plastic type of material with its inner surface thermally insulated using a layer of fiberglass or styrofoam, at the opening end of the said cap, a ring shape flange on which a layer of sponge rubber glued along the edge facing the face plate providing a means for perfectly shielding the faucet when the said cap being mounted on the face plate by two adapting screws provided on the flange, the mounting face plate having a cylindrical shape and being divided into half cylindrical plates with its center having a concentric cylindrical recess with a layer of sponge rubber glued around, with



two screws passing thru two apertured lugs adapted to draw said plates together yielding means for fastening the said plates to the neck of faucet without dismantling any part of existing faucet, a ring type of rubber sponge glued around the edge of plates on the side facing to a wall to minimizing the heat loss thru the space between the plate and the wall.

4,103,702

SOUND PROOFED VALVE FOR FLUID UNDER PRESSURE

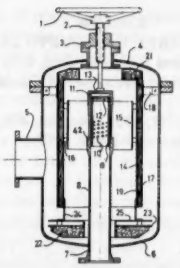
Louis Duthion; Pierre Bonnet, both of Paris, and Paul Amand Louis Coudray, Les Clayes-sous-Bois, all of France, assignors to Bertin & Cie, Plaisir, France

Filed Jun. 17, 1976, Ser. No. 697,216

Claims priority, application France, Jun. 20, 1975, 75 19305

Int. Cl.[2] F16K *47/02*

U.S. Cl. 137—375 **5 Claims**



1. A sound proofed valve for fluid under pressure, comprising a movable obturator for progressively uncovering a series of fluid expansion orifices positioned inside an expansion area, a primary sound proofing means also positioned inside said expansion area and located opposite fluid jets issuing, in operation of said valve, from said orifices, said sound proofing means forming a baffle masking an outlet for an expanded fluid, supplementary sound proofing means being spaced from said primary sound proofing means to form the base of said baffle; a primary permeable splash guard obstacle placed between said orifices and said primary sound proofing means and spaced from said primary sound proofing means; and a supplementary permeable splash guard obstacle positioned between said pri-

mary sound proofing means and said supplementary sound proofing means.

4,103,703

MULTISTAGE PILOT-CONTROLLED PRESSURE-REDUCING VALVE

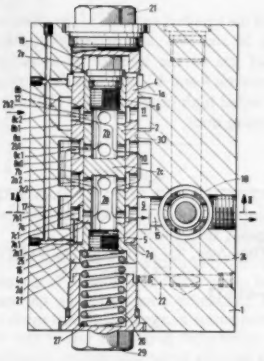
Johannes Fooke, Lohr, Main, Fed. Rep. of Germany, assignor to G. L. Rexroth GmbH, Lohr, Main, Fed. Rep. of Germany

Filed Dec. 6, 1976, Ser. No. 747,546

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1975, 2554670

Int. Cl.[2] **G05D** *7/01*

U.S. Cl. 137—501 **7 Claims**



1. A flow-control valve assembly for connection between a source of fluid under pressure and a fluid-operated load, said assembly comprising: a main valve defining a continuous flow path having an input end connectable to said source and an output end, said valve further having a valve member defining a plurality of variable flow restrictions along said path, said valve member being longitudinally displaceable in said main valve between an open position wherein said restrictions are all of maximum flow cross section and a closed position wherein said restrictions are all of minimum flow cross section, said valve member being formed with pairs of radially spaced and of longitudinally spaced compartments and two pairs of longitudinally spaced valve-member ports opening laterally from said chamber, said main valve including a housing slidably receiving said valve member and formed with two pairs of longitudinally spaced housing ports alignable and forming four restrictions with said ports of said member, said compartment forming part of said path; a pilot valve having an input side connected to said output end and an output side connectable to said load, whereby a pressure differential is created by said pilot valve between its said sides; and means connected between said sides and said valve member for displacing said member toward said open position when said pressure differential decreases below a predetermined level and for displacing said member toward said closed position when said pressure differential increases above a predetermined level.

4,103,704

SAFETY RELIEF VALVE

Donald L. Richards, Durham, N.C., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 16, 1977, Ser. No. 769,144

Int. Cl.[2] **F16K** *15/06, 17/08*

U.S. Cl. 137—522 **9 Claims**

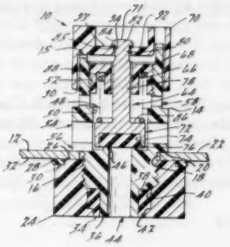
1. A relief valve comprising:

A. housing means including:

1. means defining a valve passage therein;
2. means defining a fluid inlet port communicating with said passage and adapted for connection to a source of pressurized fluid;
3. means defining a fluid outlet port communicating with said valve bore;
4. means defining a cam surface remote from said inlet port and including detent means provided on said cam surface;

B. a poppet member disposed within said valve passage and movable therein between a sealing position wherein one portion of said poppet member blocks communication between said inlet and outlet port means and an open position permitting fluid communication between said inlet and outlet ports; and

C. a generally cup-shaped acutator knob having:



1. an open end with the portion of said housing means having said cam surface received therein;
2. means defining a projection within said open end for selective engagement with said detent means;
3. means for effecting driving engagement of said knob with second portions of said poppet member remote from said fluid blocking portion upon axial movement of said knob from a first position and rotation of said knob to a second position, thereby effecting movement of said poppet member from said sealing position to said open position and
4. means formed in said knob defining a fluid outlet port communicating with said valve bore.

4,103,705

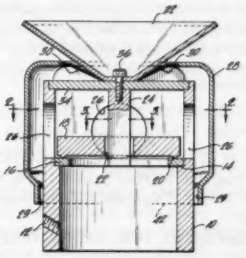
PRESSURE STABILIZER DEVICE

Walter D. Wagner, Chadds Ford, Pa., and Harold R. Gayle, Wilmington, Del., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 690,701, May 27, 1976, abandoned. This application May 26, 1977, Ser. No. 800,669

Int. Cl.[2] **B65D** *51/16;* **F16K** *15/08*

U.S. Cl. 137—544 **9 Claims**



1. A pressure stabilizer device designed to have a given open effective aperture to allow inbreathing and outbreathing of gases through it during normal operation without movement of internal parts and comprising:

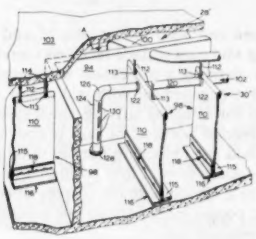
(a) a housing having a valve seat;

(b) a plate-like valve element resting on said valve seat and being spaced apart therefrom by a plurality of spacer elements, whereby the spacer elements provide a first, open aperture area through the device between the valve seat and the plate-like valve element;
(c) said plate-like valve element having a guide aperture centrally located therein;
(d) a guide element affixed to the valve housing and extending through said aperture in said plate-like element to guide any movement of the plate-like element within the housing and to prevent it from being cocked therein, with the area between the guide aperture and the guide element providing a second open aperture through the device, and whereby said plate-like valve element will lift off the valve seat and be displaced up along said guide element to provide a larger first, open aperture area in the event the pressure across the valve becomes too great.

4,103,706
RESERVOIR

Gerhard W. Moog, Toronto, and Kenneth R. Cooper, Don Mills, both of Canada, assignors to Canada Square Management Ltd., Toronto, Canada

Division of Ser. No. 579,341, May 21, 1975, Pat. No. 4,049,045. This application Aug. 30, 1976, Ser. No. 718,713
Int. Cl.² F24D *11/00*
U.S. Cl. 137—574 **2 Claims**



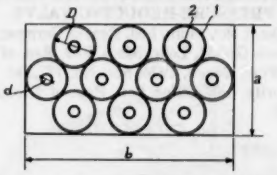
1. A heat energy storage reservoir for use in a temperature control system for a building, the reservoir comprising: a tank intended to contain a fluid and including a cover; a plurality of upright baffles disposed in spaced, generally parallel positions and formed by a plurality of sheets suspended in upright positions in the reservoir, each baffle extending from the bottom of the tank to a position above the intended level of the fluid, and from an upright wall of the tank to a position spaced from an opposite upright wall so that the baffles together define an elongate fluid flow path of serpentine form along which the fluid can flow generally horizontally in the form of a column, the tank having an inlet connection communicating with one end of said path and an outlet connection communicating with the opposite end of said path; a plurality of suspension elements extending between each said sheet and said cover; and means securing a lower marginal portion of each sheet to a bottom surface of the reservoir.

4,103,707
DEVICE FOR DISPERSING EXHAUST GASES

Gilbert Blu, Paris, and Flavien Lazarre, Pau, both of France, assignors to Societe Nationale Elf Aquitaine (Production), Paris, France

Filed Jul. 27, 1976, Ser. No. 709,227
Claims priority, application France, Jul. 31, 1975, 75 23892
Int. Cl.² F16K *19/00*
U.S. Cl. 137—604 **2 Claims**

1. A device for dispersing a gas into the atmosphere at an optimum rate from a chamber of finite volume to be evacuated and not supplied with gas during evacuation but without exceeding a predetermined gas to air ratio, said device comprising at least one mixing duct open at its two ends and a gas injector coaxial with the mixing duct and extending into said mixing duct from a tube for supplying gas at high pressure, said supply tube leading to said chamber containing the gas to be evacuated at an initial high pressure, the ratio between the

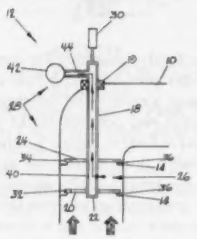


square roots of the smallest sections of the duct and the injector lying between 30 and 300, and pressure regulating means for delivering said gas to the injector at a maximum delivery pressure of between 4 and 10 bars, said delivery pressure being between said initial high pressure in the chamber and the pressure in the mixing duct.

4,103,708
VENTILATED POPPET DAMPER

Robert G. Huntington, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Nov. 22, 1976, Ser. No. 744,195
Int. Cl.² F16K *1/00*
U.S. Cl. 137—614.11 **18 Claims**

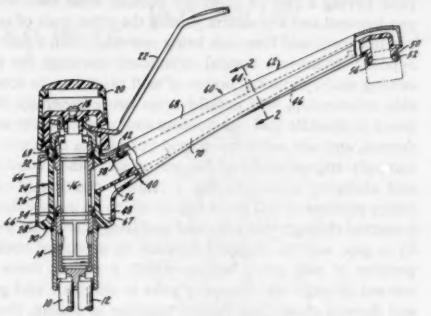


1. A ventilated poppet damper assembly for selectively opening and closing the gas stream passageway through a gas conveying conduit, the ventilated damper assembly comprising:
a first peripheral sealing seat disposed within the conduit;
a second peripheral sealing seat disposed within the conduit and spaced from the first peripheral sealing seat;
a hollow close-ended activating rod coaxially disposed within the conduit and mounted for axial movement therein;
a first damper plate coaxially disposed with the hollow rod and attached thereto proximate one of the rod ends for movement with the rod between an open position spaced from the first peripheral sealing seat and a closed position engaging the first peripheral sealing seat;
a second damper plate coaxially disposed with the hollow rod, spaced from the first damper plate, and attached to the hollow rod for movement therewith between an open position spaced from the second peripheral sealing seat and a closed position engaging the second peripheral sealing seat;
the first and second damper plates cooperating, in the closed position, to define a transverse chamber;
means for axially moving the rod and, therefore, the first and second damper plates as a unit with the rod between the open and closed positions; and,
means for ventilating the transverse chamber through the hollow rod.

4,103,709
SPOUT TUBE ASSEMBLY

Frank S. Fischer, Lorain, Ohio, assignor to Stanadyne, Inc., Windsor, Conn.

Filed Sep. 13, 1976, Ser. No. 722,661
Int. Cl.[2] E03C *1/04*
U.S. Cl. 137—615 **8 Claims**



1. A faucet spout including a non-metallic hub having a lower outwardly extending integral flange and an integral tubular spout projection in communication with the interior of said hub, valve means positioned within said hub, a spout cover having a metallic outer surface, said spout cover having a body portion surrounding said hub and extending adjacent but slightly spaced from said hub flange, a spout portion integral with said spout cover and extending outwardly therefrom, a spout tube positioned within said spout portion and terminating in a discharge opening adjacent one end thereof, said spout tube being telescopically engaged with said spout projection,

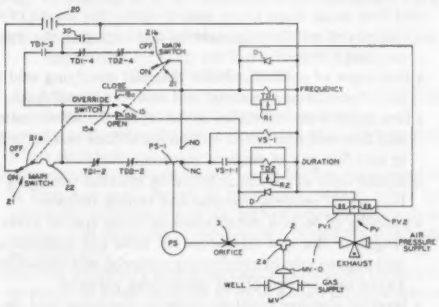
said spout cover portion being in the form of a shell, having sides, a top and an open bottom, said spout tube having a tubular section integral with a wall portion, which wall portion forms a bottom closure for said shell,

spaced support members integral with and extending outwardly from said flange for support at one end of said cover body portion, and a ring attached to said hub and bearing against the opposite end of said cover body portion, said hub and spout covers being pivotally movable, as a unit, about said valve means.

4,103,710
TIME CYCLE CONTROLLER FOR PNEUMATIC VALVE

Sidney James Labit, Kenner, and Robert Edwin Furmaga, New Orleans, both of La., assignors to Baker International Corporation, Orange, Calif.

Filed Sep. 12, 1977, Ser. No. 832,720
Int. Cl.[2] F16K *31/42*
U.S. Cl. 137—624.13 **10 Claims**

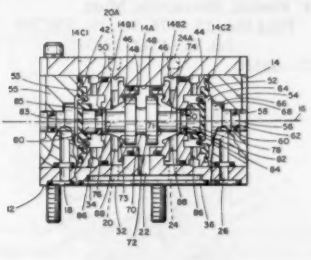


1. A controller for providing timed cycles of operation of a main valve actuated from a source of fluid pressure, comprising: a source of electric power; an electrically actuated pilot valve connected between the fluid pressure source and the main valve, said pilot valve being responsive to first and second electric pulses respectively for moving said pilot valve to its open and closed positions; relay means responsive to said first and second electrical pulses respectively for maintaining a first plurality of relay contacts in their energized positions for a first predetermined time period and a second plurality of relay contacts in their energized positions for a second pre-determined time period; a single pole pressure switch movable between two contacts in response to the application of the fluid pressure to the main valve; and means connecting a pair of normally closed contacts of each of said first and second pluralities of relay contacts in series between said power source and the single pole of said pressure switch and connecting said two pressure switch contacts to said relay means and said pilot valve whereby said first electrical pulses are generated when said normally closed contacts are closed and said pressure switch is moved to one of said two contacts and said second electrical pulses are generated when said normally closed contacts are closed and said pressure switch is moved to the other one of said two contacts, said first predetermined time period determining the duration of the opening of said pilot valve and said second pre-determined time period determining the frequency of generation of said first and second electrical pulses and the opening of said pilot valve.

4,103,711
FLUID LOGIC FLIP-FLOP

Paul Arvin, Bryan, Ohio, assignor to The Aro Corporation, Bryan, Ohio

Filed Feb. 3, 1977, Ser. No. 765,372
Int. Cl.[2] F16K *11/02*
U.S. Cl. 137—625.66 **9 Claims**



1. An improved flip-flop fluid logic device comprising, in combination:

a body having a through bore with a centerline axis, a plurality of passages through the body and connected to the bore, said passages including at least the following in serial order along the axis: first inlet passage, first exhaust passage, first outlet passage, supply inlet passage, second outlet passage, second exhaust passage, and second inlet passage;

first and second identical inserts positioned in fixed opposed relation in said bore, said first insert defining an internal fluid passage along the axis between the first exhaust passage, the first outlet passage, and the supply inlet passage and including an exhaust valve seat intermediate the first exhaust passage and first outlet passage and also including a supply valve seat intermediate the first outlet and the supply inlet passage, said second insert similarly positioned with respect to said second exhaust passage, second outlet passage and supply inlet passage;

a composite valve positioned intermediate the inserts, said valve comprising four valve members, one for cooperation with each seat of the two inserts, said valve members being rigidly connected and spaced from one another to

seat one pair of said valve members against the supply valve seat of the first insert and the exhaust valve seat of the second insert or to seat the remaining pair of said valve seat members against the supply valve seat of the second insert and the exhaust valve seat of the first inserts, said valve members for engaging the exhaust valve seat including ring seal means for engaging the respective exhaust valve seats, said valve members for engaging the supply valve seats being substantially a planar surface;

first fluid pressure responsive means intermediate the first inlet passage and first exhaust passage, said first fluid pressure responsive means being mechanically connected with the composite valve to displace said valve along the axis in response to fluid pressure through the first inlet passage, said first fluid pressure means having an effective surface area greater than the effective surface area of the valve member associated with the supply valve seat of the second insert;

second fluid pressure responsive means intermediate the second inlet passage and the second exhaust passage, said second fluid pressure responsive means being mechanically connected with the composite valve to displace said valve along the axis in response to fluid pressure through said second supply inlet, said second fluid pressure means having an effective surface area greater than the effective surface area of the valve member associated with the supply valve seat of the first insert; and

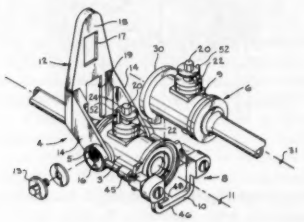
means for sealing the opposite ends of the bore and providing a chamber for fluid pressure to effect operation of the fluid pressure responsive means in response to fluid pressure through the first or second supply inlet.

4,103,712

POSITIVE ISOLATION DISCONNECT

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Morley V. Friedell, Stevensville, Mont.

Filed Dec. 15, 1976, Ser. No. 750,792
Int. Cl.[2] F16L *29/00*
U.S. Cl. 137—637.05 **3 Claims**



1. A positive isolation quick-disconnect comprising:

(a) A pair of axially separable valve housing members having through-bores communicating when said housings are coupled at an interface to form a passage therethrough, wherein the coupled ends of said housings are radially outwardly flanged and spaced away from said interface, and wherein one of said housings is provided with a pair of radially outwardly extending coaxial, fixed stub shafts;

(b) a poppet valve axially slidable within each of said housings and disposed in coaxial, end-to-end relationship with their abuting ends capable of forming a fluid-tight interface;

(c) a valve seat in each of said housings for sealingly engaging said valves at said interface;

(d) an operating stem engaging each of said valves for controlling the positions of said valves, said stems extending through said housings for external manipulation of said valves through their open and closed positions;

(e) clamping means for selectively connecting and disconnecting said housings, said clamping means comprising (1) a pair of cross-linked pivot legs disposed on opposite sides of said one housing, each said pivot leg having a cylindrical boss with an eccentric opening therethrough for receiving one of said housing stub shafts extending radially therethrough, said eccentric openings being coaxial with one another and said pivot legs being cross linked for common rotation, and (2) a generally U-shaped clamping yoke having a pair of generally parallel arms each with one free end and a crossarm joining the other ends of said parallel arms, said free ends being provided with a pair of opposed, transverse coaxial cylindrical openings for receiving said cylindrical bosses of said pivot legs in rotatable relationship, said parallel arms being generally disposed to straddle said one housing and parallel to the axis thereof, and said crossarm of said yoke being disposed to matingly engage said end flanges of said other housing, said clamping means having a relaxed position in one rotary position of said pivot legs in which no pulling force is exerted through said yoke and said flanges are separated by a gap, and an engaged position in a second rotary position of said pivot legs in which a pulling force is exerted through said clamping yoke to eliminate said gap and thereby clamp said flanges together in sealing, fluid-flow relationship; and

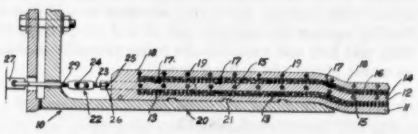
(f) interlock means between said valve operating stems and said clamping means to permit release of the clamping means only when both of said valves are in the closed position.

4,103,713

REINFORCED OIL HOSE

Benjamin Haytock, III, Erie, Pa., assignor to Continental Rubber Works, Erie, Pa.

Filed Mar. 24, 1977, Ser. No. 780,711
Int. Cl.[2] F16L *11/08, 11/12*
U.S. Cl. 138—133 **4 Claims**



1. A reinforced oil hose assembly comprising,

a tubular inner liner of oil-resistant material,

a tubular first ply of reinforcing material made of fabric overlying said inner lining and resting thereon,

a plurality of first metal rings overlying said first ply of reinforcing material,

said first metal rings being spaced along the length of said first ply of reinforcing material and engaging the outside periphery thereof,

a first layer of resilient tubular material overlying said first ply of reinforcing material and said first metal rings,

a first spiral wire embedded in the layer of resilient material and disposed concentric to said inner liner and embedded in said first ply of resilient material,

a second layer of tubular reinforcing material overlying said first ply of resilient material and resting thereon,

a plurality of second metal retaining bands spaced along the length of the said reinforced oil hose and concentric to said second ply of reinforcing material and disposed between said second ply of reinforcing material,

a layer of abrasive resistant material overlying said second ply of reinforcing material and said second retaining bands and a spiral material wound around said tubular member embedded in said abrasive material.

4,103,714

APPARATUS FOR REMOVING FLUES FROM SELVAGE YARN FEEDING DEVICE OF WEAVING LOOM

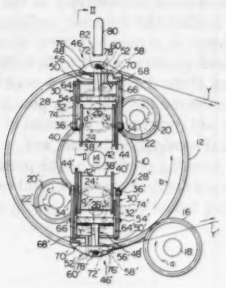
Tetsuzi Hasebe, Koganei, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Nov. 30, 1976, Ser. No. 746,111

Claims priority, application Japan, Mar. 29, 1976, 51-36292[U]

Int. Cl.[2] D03I *1/00*

U.S. Cl. 139—1 C **22 Claims**



1. In a weaving loom having a selvage yarn feeding device including a pair of selvage yarn feeding units rotatable about respective axes concurrently revolvable about a common axis substantially parallel with the respective axes of rotation of said units and each of which has a yarn guide area movable describing a closed-loop composite curve substantially symmetric with respect to said common axis and which has two predetermined angular positions substantially symmetric to each other with respect to said common axis, the selvage yarn feeding units being alternately movable in cycles into a predetermined transistional position in which the yarn guide area of each of the yarn feeding units is at least partially in one of said angular positions, a method of removing fibrous flues from the respective yarn guide areas of said selvage yarn feeding units during operation of the weaving loom, comprising producing signals respectively representative of the cycles in which said selvage yarn feeding units are to be alternately moved into said transitional position, and periodically inducing streams of air through the yarn guide area of each of said yarn feeding units being moved through said transitional position in response to said signals, and each of said streams of air being of a limited duration and having substantially fixed directional relationship to said angular position.

4,103,715

VERSATILE HAND LOOM

Ramsay L. Harris, 1175 W. Baseline Rd., Claremont, Calif. 91711

Continuation-in-part of Ser. No. 661,692, Feb. 26, 1976. This application Nov. 21, 1977, Ser. No. 853,396

Int. Cl.[2] D03D *29/00*

U.S. Cl. 139—33 **7 Claims**

1. In a hand loom, the combination comprising:

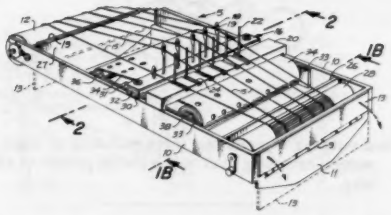
means for uniformly advancing a plurality of warp threads in a first direction;

shuttle means including a shuttle board for free movement of at least one weft thread in reciprocal motion solely by gravitational forces across the path of said warp threads in a transverse direction to the direction of said warp threads advance; and

means for selectively arranging each of said warp threads in an upper or lower position to form a shed through which said shuttle means passes,

said means for selectively arranging each of said warp threads comprising movable warp thread holding means cooperating with means for transporting a pattern member adapted to determine the upper or lower position of each warp thread in conformance with preselected instructions contained upon said pattern member;

said pattern member transport means being adapted to selectively advance in synchronism with said warp threads, move in a direction opposite to the direction of the warp



thread advancement, or remain static as said warp threads advance;

said warp thread advancement means and said shuttle means being movable in a vertical plane in a direction away from said pattern transport means to permit ready access thereto.

4,103,716

LENO MOTION DEVICE

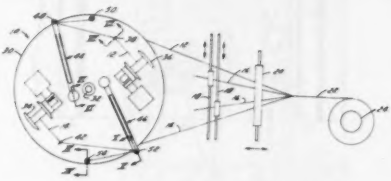
Joseph Rene Cornellier, Knowlton, Canada, assignor to Neretex Corp., Chicago, Ill.

Filed Apr. 11, 1977, Ser. No. 786,596

Claims priority, application Canada, Mar. 15, 1977, 273993

Int. Cl.[2] D03D *7/00*

U.S. Cl. 139—54 **9 Claims**



1. A device for forming selvage in a weaving apparatus, said device comprising a rotatable plate member, first and second plate guide means associated with said plate member, first and second thread supply means mounted on one side of said plate member, and first and second tensioning members pivotably mounted on said one side of said plate member, each of said first and second tensioning members comprising an elongated arm having at one end thereof guide means through which thread passes from said supply means to an associated plate guide member, the other end of said arm being pivoted on said one side of said plate member such that said thread guide means and said plate guide means are aligned with each other under tensionless conditions, and means for biasing said arm so as to maintain tension on a thread passing from said supply means through said guide means to said plate guide means.

4,103,717

SEAM WEBBING

Gilbert A. Clark, Perth Amboy, N.J., assignor to William Kenyon & Sons, Inc., Perth Amboy, N.J.

Filed Jun. 18, 1976, Ser. No. 697,338

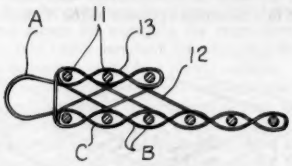
Int. Cl.[2] D03D *25/00;* D21F *1/12, 7/10*

U.S. Cl. 139—383 A **5 Claims**

1. A woven seam webbing formed from interwoven warp and filling yarns for use in receiving pintle means for joining dryer felts and the like comprising:

a series of spaced monofilament upright pintle receiving loops carried adjacent an edge of said webbing;

said monofilament loops being formed in spaced filling yarns; and



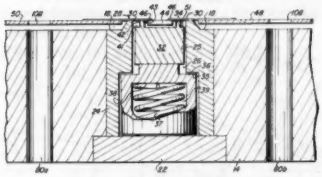
said webbing adjacent said loops including an upper woven portion extending over only a partial portion of said webbing.

4,103,718

APPARATUS FOR CUTTING AND FORMING FLEXIBLE BEAM LEADS OF AN INTEGRATED CIRCUIT CHIP

Conrad John Steigerwald, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Oct. 6, 1977, Ser. No. 839,965
Int. Cl.[2] B21F *1/00*
U.S. Cl. 140—105 **10 Claims**



1. In combination: die wall means, said die wall means having a planar upper surface and contiguous inner surfaces substantially perpendicular to the upper surface, the inner surfaces of the die wall means forming a die recess, a stop formed in the die wall means, the intersections of the upper surface and the inner surfaces defining continuous die cutting edges lying in a die cutting plane, said die wall means adapted to be mounted on the base plate of a punch press;

a forming block reciprocally mounted in the die recess for reciprocal movement therein; said forming block having an upper surface, contiguous outer surfaces, and a forming shoulder; continuous forming edges positioned substantially at the intersections of said outer surfaces and the upper surface, the outer surfaces of the forming block being spaced a predetermined distance from the inner surfaces of the die; said contiguous outer surfaces and the forming shoulder defining a punch receiving space; the upper surface of the forming block lying slightly below the die cutting plane; a recess formed in the upper surface of the forming block adapted to receive a work piece; and a stop shoulder formed on said block;

means for exerting force on the forming block to force the stop shoulder of the block against the stop formed in the die recess of the die,

punch wall means, said punch wall means having a planar forming surface, contiguous outer surfaces, and contiguous inner surfaces; the inner and outer surfaces of the punch wall means being substantially perpendicular to the planar forming surface; the inner surfaces forming a punch recess; the intersections of the forming surface and the outer surfaces of the punch wall means forming continuous punch cutting edges; and continuous punch forming edges positioned substantially at the intersections of the bottom surface and the inner surfaces; said punch cutting edges lying in a punch cutting plane; a portion of the punch wall means adapted to fit within the punch receiving space of the die; said punch wall means adapted to be mounted on the top plate of a punch press;

a pressure pad reciprocally mounted in the punch recess for reciprocal movement therein; and

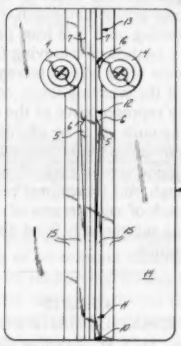
means for exerting pressure on the pressure pad to force the pad toward the forming block, said pressure pad normally projecting below the punch cutting plane.

4,103,719

UNIVERSAL LEAD FORMING TOOL FOR DUAL-IN-LINE INTEGRATED CIRCUIT PACKAGES

Wilbur W. Witt, 2517-A Suffolk Ave., High Point, N.C. 27260

Filed Aug. 11, 1977, Ser. No. 823,585
Int. Cl.[2] B21F *1/02*
U.S. Cl. 140—147 **11 Claims**



1. A hand operated tool for automatically straightening leads on an IC chip prior to insertion in an IC socket, said tool comprising

a forming rail being generally of a rectangular shape having a flat top surface to accomodate the flat bottom surface of the IC chip to facilitate sliding said IC chip along said top surface,

said forming rail having opposite side surfaces flared outwardly to force the leads on the IC chip outwardly as said chip is slid along said guide rail,

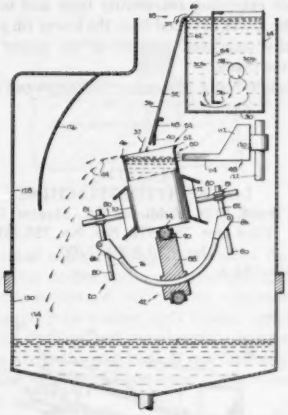
and roller means located away from opposite sides of said forming rail at distances slightly less than the thickness of said leads to force said leads downwardly against said opposite sides after said leads have been forced outwardly,

said IC chip being slid off one end of said forming rail with said leads at substantially 90° angles with respect to the plane of said chip and parallel to each other.

4,103,720
METHOD AND APPARATUS FOR FILLING CONTAINERS WITH LIQUID

Bernard C. Eisenberg, Rockaway, N.J., assignor to Solbern Corp., Fairfield, N.J.

Filed Oct. 21, 1976, Ser. No. 734,667
Int. Cl.[2] B55B *3/26*
U.S. Cl. 141—1 **46 Claims**



1. A method for filling a container with a material capable of flowing while maintaining the exterior of the container free of the material, the container having an open top portion and a side portion at the exterior thereof adjacent the open top portion, comprising:

(a) forming a flow of material descending toward a predetermined location, the extent of the descending flow adjacent the predetermined location being exposed;

(b) placing the container adjacent the predetermined location with the open top portion thereof facing upwardly toward the exposed extent of the descending flow of material and being in the path of flow thereof, the side portion of the container being exposed when the container is placed adjacent the predetermined location; and

(c) directing at least one stream of fluid toward the exposed side portion of the container adjacent the open top portion thereof as at least a portion of the exposed extent of the descending flow of material flows into the open top portion of the container, the stream of fluid directed toward the exposed side portion of the container being diverted by the exposed side portion to flow about the container and away thereform, the stream of fluid being operative to deflect the exposed extent of the descending flow of material not entering the open top portion of the container away from the side portion at the exterior of the container adjacent the top portion thereof and to urge any material overflowing the container to move laterally away from the open top portion of the container without contacting the exterior of the container.

4,103,721
METHOD AND APPARATUS FOR BOTTLING BEER

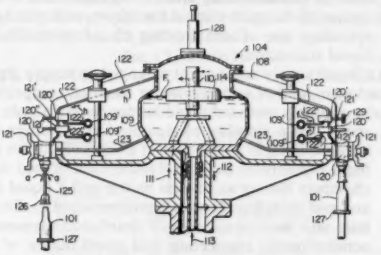
Sadao Noguchi, Nagoya, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1976, Ser. No. 753,842
Int. Cl.[2] B65B *31/00*; B67C *3/06*
U.S. Cl. 141—6 **7 Claims**

1. In a method of bottling beer wherein beer is supplied to an empty bottle from a bottling tank containing beer and air under pressure, the improvement comprising:

leading an empty bottle to a first counter-pressurizing section and thereat pressurizing the interior of said bottle by means of pressurized air fed from a pressurized air source separate from said bottling tank and at a pressure less than the pressure of said air in said bottling tank;

then leading said bottle to a second counter-pressurizing section and thereat pressurizing said interior of said bottle



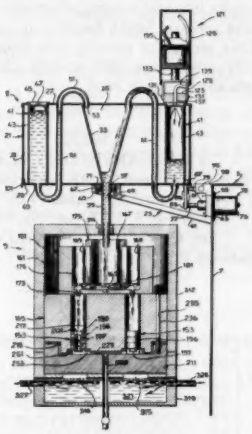
by means of pressurized air fed from said bottling tank until said interior of said bottle is at the same pressure as said air within said bottling tank; and

thereafter leading said bottle to a bottling section and thereat supplying beer into said bottle.

4,103,722
APPARATUS FOR SEQUENTIALLY TREATING ONE OR MORE SPECIMENS OF CELLULAR MATERIAL WITH A PLURALITY OF TREATING LIQUIDS

Max Zollinger, 7589 de Normanville, Montreal, Quebec, Canada

Filed Aug. 23, 1976, Ser. No. 716,780
Int. Cl.[2] B65B *3/14*
U.S. Cl. 141—70 **7 Claims**



1. Apparatus for use in treating cellular material with a plurality of liquids, comprising:

(A) a tissue treatment component, comprising:

(a) a treating element having a plurality of treating chambers arranged in a circle about a vertical axis, each treating chamber having a liquid inlet at its top and a liquid outlet at its bottom;

(b) a mounting base for receiving and supporting said treating element, and having a liquid outlet to which are connected said liquid outlets of all the treating chambers of said treating element;

(c) tissue mounting means receivable within said treating chambers, for supporting cellular material to be treated; and

(d) liquid distributing means arranged to distribute liquid to said liquid inlets of said treating chambers, including a distributor element having a main central liquid distributing well and a plurality of secondary liquid distributing wells arranged in a circle about said main well, each of said secondary wells being connected with said main well to receive liquid therefrom, and with a corresponding one of said treating chambers to discharge liquid thereto; and

(B) a liquid supply component arranged to supply liquid to said main well of said distributor element, comprising:

(a) a rotatably mounted liquid holder having a main liquid outlet and a plurality of separate liquid storage chambers arranged in a circle about a vertical axis for carrying a plurality of treating liquids, each of said storage chambers having an inlet in its top and a liquid outlet, and said main liquid outlet being arranged to discharge into said main well of said distributor element; and conduit means connecting said liquid outlets of all of said storage chambers with said main liquid outlet;

(b) storage chamber emptying means operatively associated with said liquid holder, including: a vertically movable head mounted above said circle of liquid storage chambers, said storage chambers being alignable with said head as said liquid holder is rotated; means arranged and operable to move said head downwardly onto the top of a selected one of said storage chambers to tightly close the same and to return said head to an elevated position when desired, said movable head carrying conduit means that is connected with said inlet of the associated storage chamber when said head is moved downwardly to close the top of the chamber; and means operable for introducing compressed air through said conduit means of said vertically movable head into said selected storage chamber while said head is pressed against the top of said chamber, for causing the liquid carried within the selected storage chamber to move into said treating chambers via said main liquid outlet and said liquid distributing means; and

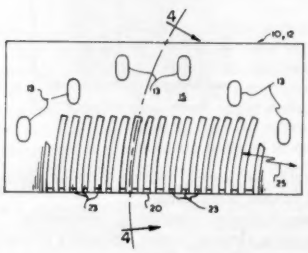
(c) drive means for rotating said liquid holder for selectively positioning said storage chambers under said vertically movable head.

4,103,723

TREE HARVESTING BLADE

William Earl Carmichael, 2592 McBride Crescent, Prince George, British Columbia, Canada (V2M 2A1)

Filed Jul. 5, 1977, Ser. No. 812,606
Int. Cl.[2] A01G *23/08*; A47J *49/02*
U.S. Cl. 144—34 E **10 Claims**



1. A tree shear blade characterized by:

(a) a web portion having; upper and lower web faces, a datum plane, a lower bevelled face and a cutting edge, the cutting edge being defined by intersection of the lower bevelled face with the upper web face at the datum plane of the web portion,

(b) a plurality of similar upper rib portions spaced along the blade and extending upwardly from the upper web face and rearwardly from the cutting edge, each rib portion being generally rectangular in cross-section and having a leading end having an inclined rib leading face extending rearwardly from the cutting edge,

(c) a plurality of similar lower rib portions spaced along the blade and extending downwardly from the lower web face and rearwardly from the lower bevelled face, each lower rib portion being generally rectangular in cross-section and having a leading end having an inclined rib leading face extending rearwardly from and being coplanar with the lower bevelled face, the lower rib portions being generally stagge.ed relative to the upper rib portions along the blade,

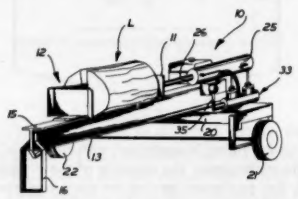
each rib portion being adapted to follow sweep of the blade.

4,103,724

LOG SPLITTING MACHINE

Murray D. Braid, 8126 Middlesex Rd., Mentor, Ohio 44060

Filed Dec. 29, 1976, Ser. No. 755,251
Int. Cl.[2] B27L *7/00*
U.S. Cl. 144—193 A **4 Claims**



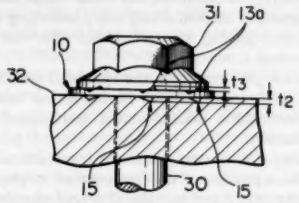
1. A manually movable log splitter for longitudinally splitting a log comprising a support having a horizontally extending surface for supporting the log to be split, a base plate having first and second major surfaces which extend generally parallel, said first major surface being in contact with said horizontally extending surface of said support, a double-angled wedge structure secured to said second major surface and located at one end of said support to engage one end of a log, a ram for engaging the other end of the log, means for adjustably securing said plate to said horizontally extending surface of said support to adjustably position the double-angled wedge structure along said horizontally extending surface of said support, hydraulic means for moving the ram to force the one end of the log against the double-angled wedge structure and cause movement of the log relative thereto, said double-angled wedge structure comprising a pair of plates extending transverse to the direction of movement of the ram, each of said pair of plates having first portions which converge at one angle as they extend toward the one end of the log and second portions which converge at another lesser angle as they extend toward the one end of the log from said first portions, said double-angled wedge structure having a splitting edge which extends transverse to the direction of log movement and which engages the one end of the log to initiate splitting thereof, said second portions having outer surfaces which engage the splitting log to force portions of the log apart, said first portions having outer surfaces which engage the splitting log and increase the splitting action per increment of movement of the ram as compared to the splitting action of said second portions, ground-engaging wheels supporting said support, and means on said support which may be manually gripped for moving said log splitter along the ground, said base plate having a first leading side surface extending generally transversely between said first and second major surfaces, said first leading side surface protruding beyond said double-angled wedge structure and having an angled surface to upwardly cam the log toward the splitting edge of said double-angled wedge structure.

4,103,725

CONICAL SPRING WASHER

Michio Abe, Kasugai, Japan, assignor to Kinoshita Seiki Kabushiki Kaisha, Kyoto, Japan

Filed Oct. 27, 1976, Ser. No. 736,187
Claims priority, application Japan, Oct. 28, 1975, 50-129706
Int. Cl.[2] F16B *39/24*
U.S. Cl. 151—35 4 Claims



1. A truncated conical spring lock-washer for fitting between a fastening device and a material through which said fastening device is fastened, said washer comprising:

a conical spring lock-washer body having upper and lower contacting surfaces, said upper surface being substantially the same size as the underside of said fastening device and contactable thereby and said lower surface contacting said material; and

a plurality of deformable lock pawl means extending downward from said lower contacting surface of said washer toward said material for engaging said material when said fastening device is tightened and for deforming and pushing areas of said pawl means upward to engage against said underside of said fastening device when said device is tightened, whereby said fastening device is engaged and prevented from loosening, each lock pawl means comprised of:

a substantially triangular, inclined V-shaped depression in and extending beneath said lock-washer body having one gradually sloped face in the tightening direction of said fastening device, and a sharply sloped face in the loosening direction of said fastening device.

4,103,726

METHOD OF MAKING A TIRE AND SAID TIRE

James D. Wolfe, North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 7, 1973, Ser. No. 422,640
Int. Cl.[2] B60C *1/00*
U.S. Cl. 152—330 R 3 Claims

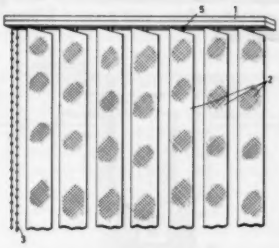
1. A tire, including a unitary reinforcing network filled with an elastomer, said network being a reticulated foam plastic.

4,103,727

SLATTED BLINDS

Horst Spohr, Cuxhaven, Fed. Rep. of Germany, assignor to Bautex Adolf Stöver KG., Langen-Sievern, Fed. Rep. of Germany

Filed Nov. 9, 1976, Ser. No. 740,181
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1975, 2554351; Jun. 23, 1976, 2628162
Int. Cl.[2] E06B *9/30*
U.S. Cl. 160—168 R 17 Claims



1. A slatted blind consisting of a support rail, vertically disposed slats which are all rotateable to a limited extent around their longitudinal axes and which are shiftable laterally on said support rail, a guide carriage for each slat, pivot means positioned in said guide carriage, a screw threaded shaft extending through said guide carriages, threaded nuts mounted in said guide carriages and fitted on said shaft, said nuts having inner threads matching the screw threads on the shaft, a bush arranged on the pivot means of each slat, a gear ring formed on the outside of said bush, said nuts also having outer threads for driving said gear rings, said pivot means having friction surfaces and said bush having pressure surfaces resiliently acting on said friction surfaces to form a slip clutch, said bush being provided with a plurality of integral resilient fingers spacedly mounted from the body of said bush so that when said pivot means are inserted to be in operative position the fingers flex inwardly and when operative frictional mating occurs the fingers are released from said inward deflection and operatively bear upon said friction surfaces with said friction surfaces and said resilient fingers being in mating and locked relationship with respect to each other, said fingers having said pressure surfaces which are knurled and said friction surfaces on said pivot means also being knurled with said slip clutch components being operatively engaged only by exertion of frictional forces.

4,103,728

MEMBRANE MOUNTING SYSTEM FOR WINDOWS

Robert E. Burdette, 2032 Verde Ave., Akron, Ohio 44314, and Aubrey M. Fuller, 5832 Spikerman Dr., Clinton, Ohio 44216

Filed May 6, 1977, Ser. No. 794,470
Int. Cl.[2] E06B *3/00*
U.S. Cl. 160—368 R 7 Claims

1. A system for mounting a thin, flexible membrane over the interior of a window having a peripherally disposed angular frame mounted in a plane comprising:

an elongate, narrow retainer molding extensible along a substantial portion of said frame for defining an angular geometric shape generally corresponding to the window frame, said retainer molding including a narrow base portion having a flat, outwardly disposed connecting surface for positioning adjacent said frame;

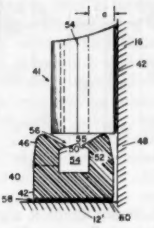
first and second elongate side components formed integrally with and extending from said base portion and having mutually inwardly disposed opposed side surfaces spaced to define an elongate central groove having a width *b*, the top surface of each said first and second side component being configured to slope toward said groove at an acute

angle with respect to said connecting surface to define a concave self-aligning receiving region;

said first and second side component top surfaces further being configured to extend a given distance over each said side surface to define detent means;

means for connecting said retainer molding to said frame such that said flat base portion connecting surface abuts against the surface of said frame;

resilient beading means having a circular cross-section of diameter corresponding to the width *b* of said groove for positioning over a peripheral portion of said membrane and subsequent insertion thereof into said groove and whereby extraction from said groove is arrested by said detent means; and



said first and second side components are configured having substantially equivalent thicknesses with each other and with said flat base, the angular geometric shape defined by the frame and the molding including at least three angles and the molding defining the geometric shape being formed by at least three separate pieces, the receiving region of one of said pieces having a first orientation with respect to the plane of said frame and the receiving region of both the other pieces being oriented orthogonal to the first named piece;

the pieces being in abutting relationship at the angles and the resilient beading at a constant elevation with respect to the plane of the frame completely around the frame.

4,103,729

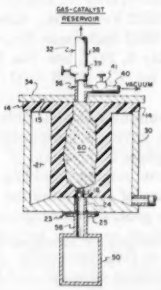
APPARATUS AND PROCESS FOR CATALYTIC GASSING IN THE MANUFACTURE OF FOUNDRY CORES AND MOLDS, AND THE LIKE

Andrew P. Dunlop, Riverside, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Division of Ser. No. 611,913, Sep. 10, 1975, Pat. No. 4,068,703. This application Mar. 7, 1977, Ser. No. 775,157

Int. Cl.[2] B22C *1/20*

U.S. Cl. 164—12 **2 Claims**



1. The method of shaping and hardening masses of catalyst-hardenable binder-coated porous particulate material with a gas catalyst in an apparatus comprising shaping means including a shaping cavity, gassing means for introducing a gas catalyst into interstitial void space in the particulate mass residing within such shaping cavity, whereby said gas catalyst is introduced into said shaping cavity at a first portion thereof, and aftervoid chamber means connected directly to said shaping cavity at a second portion thereof which is opposite said first portion of said shaping cavity, said aftervoid chamber means including a dead-end chamber of sufficient volume for gas catalyst which is introduced at said first portion to pass at least through the entirety of the interstitial voids within said shaping cavity, and means for disconnecting and connecting said shaping means to said gassing means and said aftervoid chamber means, the method comprising:

1. reducing the gas pressure in the apparatus which includes a first of said shaping means having a first mass of said catalyst-hardenable binder-coated particulate material packed therein;
2. introducing a gas catalyst into the apparatus sufficiently for at least a portion of said gas catalyst to pass through the shaping cavity and into the aftervoid chamber means;
3. disconnecting and removing the first shaping means from the apparatus, and replacing it with a second shaping means having a second mass of catalyst-hardenable binder-coated particulate material packed therein, wherein a respective first portion thereof is hermetically joined to said gassing means, and a respective second portion thereof is hermetically joined to said aftervoid chamber means;
4. reducing the gas pressure within said apparatus by withdrawing at least the interstitial gas in the shaping means outwardly through said respective first portion, whereby catalyst gas which was in excess and had entered the aftervoid chamber means during the preceding gassing step is drawn into the shaping cavity and catalyst gas is drawn into intimate contact with at least a portion of said second mass of catalyst-hardenable binder-coated porous particulate material residing in said second shaping chamber means, and
5. introducing fresh gas catalyst into the shaping cavity through said first portion thereof sufficiently for at least some of the newly introduced catalyst gas to pass through the shaping cavity and into said aftervoid chamber means.

4,103,730

PROCESS FOR ELECTROMAGNETIC STIRRING

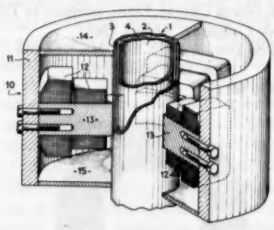
Bernard Emile André Dussart, Denain, France, assignor to Union Siderurgique du Nord et de l'Est de la France, Paris, France

Continuation of Ser. No. 593,959, Jul. 8, 1975, abandoned. This application Dec. 7, 1976, Ser. No. 748,301

Claims priority, application France, Jul. 22, 1974, 74 25315

Int. Cl.[2] B22D *27/02*

U.S. Cl. 164—49 **4 Claims**



1. A continuous-casting process for liquid metal comprising the steps of:

pouring liquid metal into a stationary continuous-casting mold having a copper wall of about 10 to 20mm thickness;

producing a rotating electromagnetic induction field in the mold and in the metal having an intensity between 500 and

2000 Gauss and exciting the electromagnetic induction field with an alternating current having a frequency less than 10 Hz thereby minimizing eddy currents in the mold and attenuating field damping;

rotating the electromagnetic induction field about an axis substantially parallel to a longitudinal axis of the mold to rotate liquid metal relative to the solidified peripheral portion at a frequency between a synchronism frequency, defined as the frequency at which the induction field and the liquid metal have the same rotational speed, and twice the synchronism frequency;

thereby scraping inclusions and porosities from the solidified peripheral portion by relative movement between the liquid metal and the solidified peripheral portion and moving the inclusions and porosities toward the center of the liquid metal by the effect of the centrifugal force exerted on the metal which is much more dense than the inclusion and porosities so that an improved surface structure results.

4,103,731

SHAKE-OUT MACHINE FOR USE WITH SELF-CURING MOLD

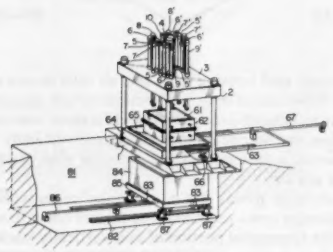
Shunichi Aoki, and Eiji Maeda, both of Shimizu, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 11, 1977, Ser. No. 767,889

Claims priority, application Japan, Feb. 18, 1976, 51-57812; Feb. 18, 1976, 51-17203[U]; Feb. 27, 1976, 51-21611[U]; Apr. 23, 1976, 51-50061[U]

Int. Cl.² B22D *29/00*

U.S. Cl. 164—147 **11 Claims**



1. A shake-out machine for use with a self-curing mold, the shake-out machine comprising:

a body member provided with a bridge-shaped frame, a plurality of hydraulic cylinder means disposed on the top of a ceiling portion of said frame;

a downwardly directed plunger provided at each hydraulic cylinder means;

mold feeding means operatively associated with the body member and including a wheeled panel having an opening, said wheeled panel being movably mounted on rails laid on a floor so as to transport a mold under said plungers, said wheeled panel acting as a supporting mount for a molding flask during a shake-out operation;

a dropped material delivery means operatively associated with the body member and including a wheeled panel, said last-mentioned wheeled panel being movably mounted on rails laid on a bottom portion of a pit provided in the floor, and a delivery box mounted on said last-mentioned wheeled panel; and

means operatively connected with said hydraulic cylinder means for operating said hydraulic cylinder means independently of each other such that desired plungers in said hydraulic cylinder means may be lowered in dependence upon a size of a molding flask.

4,103,732

DEVICE FOR THE DELIVERY AND UNIFORM DISTRIBUTION OF LUBRICANTS

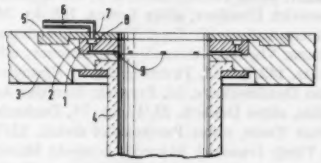
Dietrich Habert, Eschweiler, Fed. Rep. of Germany, assignor to ARBED, Aciéries Réunies de Burbach-Eich-Dudelange S.A., Luxembourg, Luxembourg and Eschweiler Bergwerks-Verein AG, Herzogenrath-Kohlscheid, Fed. Rep. of Germany

Filed Mar. 2, 1977, Ser. No. 773,387

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1976, 2609075

Int. Cl.² B22D *11/00*

U.S. Cl. 164—147 **4 Claims**



1. A continuous casting apparatus comprising mold means defining a substantially cylindrical mold cavity, a device for the delivery and uniform distribution of lubricants to the inside wall of said mold cavity, said mold means comprising an upper portion, annular chamber means in said upper mold portion, lubricant distributor ring means rotatably located in said chamber means, circular groove means in said distributor ring means, holding means rotatably holding said distributor ring means in said annular chamber means, lubricant supply means operatively connected to said holding means for supplying lubricant into said circular groove means, and lubricant conduit means operatively located for feeding lubricant into said mold cavity from said circular groove means.

4,103,733

MANUFACTURE OF FOUNDRY CORES AND MOULDS

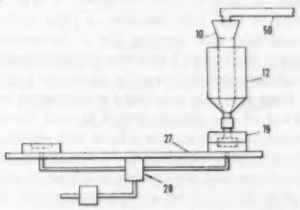
Albert Edwards, Ailsworth, England, assignor to Baker Perkins Holdings Limited, Peterborough, England

Filed May 3, 1976, Ser. No. 682,469

Claims priority, application United Kingdom, May 1, 1975, 18257/75

Int. Cl.² B22C *9/12, 15/22, 15/28*

U.S. Cl. 164—160 **7 Claims**



1. Apparatus for preparing foundry molds or cores from a cold setting sand based molding mixture comprising an indexing table having a plurality of locations thereon for mold or core boxes, a suction system positioned beneath said table and having a plurality of branches movable with said table upon indexing movement thereof and operatively connected to the respective ones of said plurality of locations, and suction valve means in said suction system for conditioning said suction system to constantly apply suction to boxes positioned at said locations on said table as said table is indexed through a plurality of work stations.

4,103,734

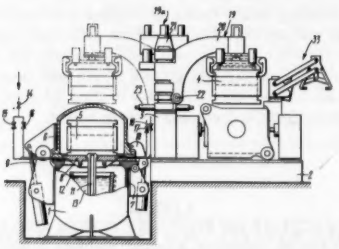
COUNTERPRESSURE CASTING ARRANGEMENT

Evgeny Emelyanovich Mikotin, ulitsa Tereshkovoi, 8a, kv. 61, Odessa; Mikhail Konstantinovich Trifsik, ulitsa Nikolaeva, 21a, kv. 8, Smolensk; Igor Stepanovich Vavilov, ulitsa Chkalova, 119, kv. 11, Odessa; Jury Danilovich Mangubi, ulitsa Krasnogvardeiskaya, 13, kv. 47, Smolensk; Boris Andreevich Timofeev, ulitsa B. Khmelnitskogo, 36, kv. 44, Odessa; Anatoly Filippovich Timofeev, ulitsa Tvardovskogo, 8, kv. 9, Smolensk; Yakov Mikhailovich Ryvkis, ulitsa Garibaldi, 14, kv. 26, Odessa; Mark Moiseevich Aizenkaid, ulitsa Lomonosova, 1/74, kv. 39, Smolensk; Nikolai Vasilievich Samusenkov, ulitsa Leningradskaya, 1, kv. 3, Odessa; Alexandr Ivanovich Ermolaev, ulitsa Lenina, 75b, kv. 38, Chernigov; Anatoly Andreevich Zuev, Tiraspolskoe shosse, 21, kv. 121, Odessa; Vladimir Alexandrovich Antonov, ulitsa Karla Libknekhta, 142, kv. 11, Tiraspol; Evgeny Efremovich Kosogov, ulitsa Dyatkovskaya, 32, Bryansk; Stanislav Andreevich Aldakushin, ulitsa Dekhoti, 23/17, kv. 76, Dushanbe; Viktor Gavrilovich Yanin, ulitsa Perekopskoi divizii, 12/7, kv. 10, Odessa; Vitaly Ivanovich Mazurik, prospekt Shevchenko, 6, korpus 1, kv. 6, Odessa; Ivan Nikiforovich Teslya, ulitsa Chkalova, 40, kv. 16, Odessa; Savely Leonidovich Burakov, Treugolny pereulok, 13, kv. 23, Odessa; Petr Petrovich Soloviev, ulitsa Nikolaeva, 42, kv. 59, Smolensk, and Rostislav Lukyanovich Snezhnoi, ulitsa Bogdana Khmelnitskogo, 34/36, kv. 42, Odessa, all of U.S.S.R.

Filed May 12, 1977, Ser. No. 796,079

Int. Cl.[2] B22D *27/10*

U.S. Cl. 164—309 **11 Claims**



1. A counterpressure casting arrangement, comprising: a pouring device; a partition plate dividing said pouring device into a top chamber and a bottom chamber, a body of said top chamber and said partition plate being turnably mounted with respect to a body of said bottom chamber; a vessel for melt accommodated in said bottom chamber; a split casting die accommodated in said top chamber; a pipe interconnecting said vessel and said split casting die; a die-casting machine disposed outside the body of said top chamber and acting as a device for assembly and disassembly of the die and for removing castings from said die; a device for reiterated introduction and withdrawal of the dies arranged in said die-casting machine; a transporting device, on which said device for reiterated introudction and withdrawal of the die is mounted, to carry the dies from said die-casting machine to said partition plate and back to the machine; a stationary spindle about which the body of said top chamber turns to permit movement of said transporting device.

4,103,735

HEAT EXCHANGER

Albert Woodrow Warner, Rte. 100, Lowell, Vt. 05847

Filed Sep. 7, 1976, Ser. No. 720,684

Int. Cl.[2] B60H *1/18*; F24H *3/02*

U.S. Cl. 165—39 **7 Claims**

1. A heat exchanger, for use with a heating plant or like device having a hot-combustion-products or exhaust-products duct, comprising:

an elongate housing;

said housing having an exhaust-products inlet means and an exhaust-products outlet means at one end thereof, for coupling of said means, interpositionally, intermediate the length of an exhaust-products duct of such a heating plant or device, to cause said housing to be supported, in cantilevered fashion, only at said one end by said exhaust-products duct;

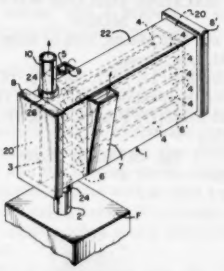
first conduit means, within said housing, opening onto said inlet means for directing exhaust-products from said one end of said housing to the end opposite;

second conduit means, within said housing, opening onto said outlet means for directing exhaust-products from said opposite end to said one end;

means disposed at said opposite end of said housing communicating said first and second conduit means for transferring exhaust-products therebetween;

means for forcing air into heat-exchanging contact with said conduit means to cause such air to be warmed; wherein,

said air-forcing means comprises an air inlet means and an air outlet means formed in said housing at said one end, and passageways formed in said housing for moving air



through said housing from said air inlet means and to said air outlet means in flow directions which are counter-current to exhaust-products flow directions therethrough;

said first and second conduit means are vertically stacked to provide maximum contact between said conduit means and the air;

said air inlet means has a triangular cross-section with a maximum cross-sectional area thereof being fixed adjacent to the uppermost portion of said vertically stacked second conduit means, and a minimum cross-sectional area thereof being fixed adjacent to the lowermost portion of said vertically stacked second conduit means, to cause said air inlet means to proportion air intake equally across said second conduit means; and

said air outlet has a triangular cross-section with a maximum cross-sectional area thereof being fixed adjacent to the uppermost portion of said vertically stacked first conduit means, and a minimum cross-sectional area thereof being fixed adjacent to the lowermost portion of said vertically stacked first conduit means, to cause said air outlet means to proportion air discharge equally across said first conduit means.

4,103,736

APPARATUS FOR HEATING A FOOD ITEM WHILE RETAINING ITS MOISTURE AND NUTRITIONAL COMPONENTS

Albert E. Colato, St. Paul, and Jerome L. Formo, Roseville, both of Minn., assignors to Anchor Hocking Corporation, Lancaster, Ohio

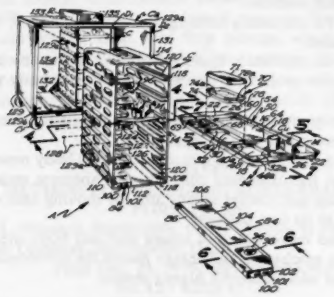
Division of Ser. No. 510,746, Sep. 30, 1974, Pat. No. 4,005,745. This application Aug. 2, 1976, Ser. No. 710,697

Int. Cl.[2] F25B *13/00*

U.S. Cl. 165—48 R **5 Claims**

1. Apparatus for heating a food item while retaining in said

food item its moisture and nutritional components comprising a food item container having a bottom and side walls and being open at the top, a removable top cover on the container, an enclosure for the container, heat energizing means within the



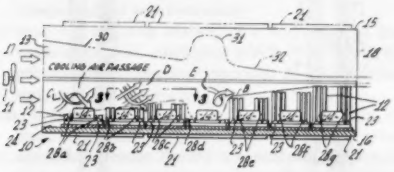
enclosure which contacts the container bottom to heat said food item in said container, and container side wall and cover cooling means connected with the enclosure for cooling the container side walls and container cover when the food item in the container is being heated.

4,103,737

HEAT EXCHANGER STRUCTURE FOR ELECTRONIC APPARATUS

Calvin C. Perkins, Simi Valley, Calif., assignor to Marantz Company, Inc., Chatsworth, Calif.

Filed Dec. 16, 1976, Ser. No. 751,156
Int. Cl.[2] F28F *13/08*
U.S. Cl. 165—80 **12 Claims**



1. An electronic apparatus comprising:

a chassis having two parallel walls with opposing internal surfaces and two open ends forming an entrance and exit;

a plurality of heat exchangers each formed of a single metal sheet of uniform thickness, having a base overlying one of said walls and a plurality of parallel, elongated fingers of uniform length extending away from said one wall and normal to said base; and

a plurality of electrically interconnected circuit elements, including at least one power transistor, each said element being mounted on said base of one of said heat exchangers and surrounded by said fingers of said heat exchanger;

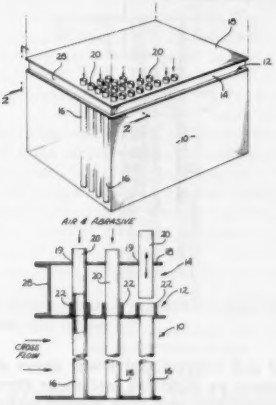
said fingers of different heat exchangers being of different lengths and being arranged according to a predetermined pattern to define between them a passage for cooling air extending from said entrance to said exit, said passage comprising a first vortical portion adjacent said entrance having an effective cross-sectional area that decreases with increasing distance from said entrance, a diffuser portion in which said passage is of maximum effective cross-sectional area centered between said entrance and said exit, and a second vortical portion adjacent said exit in which said passage is of minimum effective cross-sectional area, the effective cross-sectional area of said second vortical portion decreasing with decreasing distance from said exit.

4,103,738

REPLACEABLE INLET MEANS FOR HEAT EXCHANGER

Max M. Aydelott, West Covina; Richard L. Hartman, Hacienda Heights, and James A. York, Glendale, all of Calif., assignors to Smith Engineering Company, South El Monte, Calif.

Filed Aug. 16, 1976, Ser. No. 714,377
Int. Cl.[2] F28F *19/06, 9/02*
U.S. Cl. 165—178 **4 Claims**



1. In a heat exchanger having inlet means for accepting hot inlet fluids containing an abrasive, said heat exchanger including a plurality of elongated tubes of predetermined diameter and having its open ends disposed at a tube plate, the improvement comprising:

a bulkhead secured to said tube plate including a perforated upper plate;

a plurality of replaceable tubes, corresponding in number to the heat exchanger tubes, slidably positioned in said bulkhead upper plate and extending therethrough, each of said replaceable tubes having a length at least five times its diameter, the diameter of said replaceable tubes being substantially equal to the diameter of said heat exchanger tubes;

means cooperating with said replaceable tubes for positioning said replaceable tubes in said bulkhead for axial alignment with said heat exchanger tubes;

whereby said replaceable tubes are in substantially abutting relationship with said heat exchanger tubes.

4,103,739

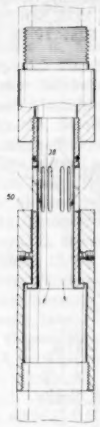
SAND RELEASE APPARATUS FOR A PUMP

L. D. Hall, P.O. Box 264, Hull, Tex. 77564

Filed Sep. 3, 1976, Ser. No. 720,246
Int. Cl.[2] E21B *43/00*
U.S. Cl. 166—105 **8 Claims**

1. An improvement in an oil well pump which pump is typically installed in a well for lifting liquid to the surface which liquid carries with it sand and which pump is exposed to sand locking between the pump and the tubing string in which it is installed, the improvement comprising first and second tubular sleeves which are telescoped together to be incorporated in the body of the pump and forming an elongate tubular extension thereof, said tubular sleeves being joined by a means which is operable only on exceeding an axial pull beyond a specified level which relatively axially separates the sleeves, one of the sleeves being affixed to the upper portions of the pump and the other of the sleeves being affixed to the lower portions of the pump and which sleeves are in a closed telescoping arrangement prior to pulling and which pull apart to an extended telescoping arangement, and a set of drain opening

means on the inner sleeve which opening means are exposed upon extending telescoping movement to thereby drain sand around the exterior of the pump through the opening means to the interior of the pump and downwardly through the lower



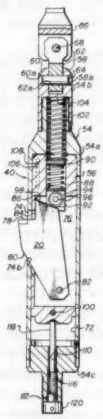
portions thereof and wherein said lower sleeve closes said drain opening means by encircling said upper sleeve and including a seal means above said drain opening means for sealing against flow through said drain opening means prior to extension by telescoping movement.

4,103,740

WELL TOOL WITH A PAWL

John H. Yonker, Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Jun. 2, 1977, Ser. No. 802,732
Int. Cl.[2] E21B *7/06*
U.S. Cl. 166—117.5 **12 Claims**



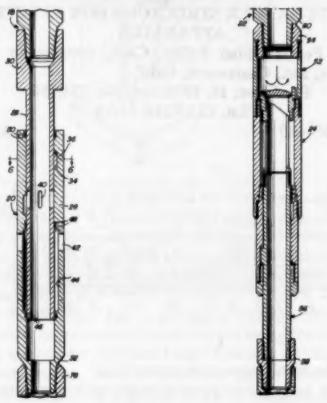
1. In combination:
a well tool comprising:
body means,
carrier means carried by said body means and movable with respect to said body means between a first position and a second position,
pawl means carried by said carrier means and when said carrier means is in its first position being movable between a position projecting laterally beyond said body means and a retracted position with respect to said body means and when said carrier means is in its second position being maintained in a retracted position with respect to said body means,
means for resiliently urging said carrier means towards its second position,
means for releasably holding said carrier means in its first position,
means for resiliently biasing said pawl means towards its position projecting laterally beyond said body means, and
said body means including aperture means for providing access to said carrier means; and
redressing tool means cooperable with said body means and adapted for extending through said aperture means for engaging said carrier means and for moving said carrier means to its first position;
one of said redressing tool means and said body means including mechanical advantage means for overcoming the force of said resiliently urging means.

4,103,741

OIL WELL PERFORATION TESTING DEVICE

Milton L. Daigle, Houma, La., assignor to Tool Masters, Inc., Houma, La., a part interest

Filed Jun. 1, 1977, Ser. No. 802,481
Int. Cl.[2] E21B *33/124*
U.S. Cl. 166—147 **11 Claims**



1. A perforation wash tool including an elongated tubular assembly defining a longitudinal main passage therethrough, longitudinally spaced opposing packer means carried by and extending about the exterior of said tubular assembly intermediate the opposite ends thereof, said tubular assembly including a continuously open bypass passage extending therealong independent of said main passage and opening, at its opposite ends, to the exterior of said assembly on the remote sides of said packer means, said assembly further including continuously open perforation wash fluid passage means communicating the interior of said central passage with the exterior of said assembly intermediate said packer means, said main passage extending the full length of said wash tool, being longitudinally straight and unobstructed and opening centrally outwardly of the opposite ends of said tubular assembly, said bypass being defined by a generally annular passage extending longitudinally of said tubular assembly disposed about said main passage inwardly of the exterior of said tubular assembly, said wash tool including a central tubular body having a threaded bore formed therethrough including opposite end threaded counterbores, loosely telescopingly engaged inner and outer tubular mandrils threaded into said bores and counterbores, respectively, at each end of said body, tubular end subs threaded onto

the remote ends of said outer mandrils and into which the remote ends of said inner mandrils are rotatably and telescopingly sealingly received, said packer means being carried by said outer mandrils, said central body including a flow passage therethrough, outwardly of said threaded bore, communicating the annular areas defined between said inner and outer mandrils, said subs including lateral openings therein opening into said annular areas, said flow passage, annular areas and lateral openings defining said bypass passage, and said wash fluid passage means including lateral ports in said central body opening into said threaded bore and outwardly of the exterior of said central body independent of said flow passage.

4,103,742

METHOD FOR ACIDIZING SUBTERRANEAN FORMATIONS

Billy L. Swanson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 24, 1975, Ser. No. 643,983
Int. Cl.[2] E21B *43/27*
U.S. Cl. 166—282 **31 Claims**

9. A method for acid treating a porous subterranean formation susceptible of attack by an acid and penetrated by a well bore, which method comprises:

injecting into said formation via said well bore a gelled acidic composition comprising

water;

a water-thickening amount of a water-dispersible copolymer of acrylamide or methacrylamide with another ethylenically unsaturated monomer copolymerizable therewith, sufficient acrylamide or methacrylamide being present in the monomer mixture to impart said water-dispersible properties to the resulting copolymer when it is mixed with water;

an amount of an acid which is capable of, and sufficient for, reacting with a significant amount of the acid-soluble components of said formation;

a small but effective amount of a mixture of at least two water-dispersible aldehydes which is sufficient to cause gelation of an aqueous dispersion of said polymer, said acid, and said aldehydes;

said polymer, said acid, and said aldehydes, in the amounts used, being sufficiently compatible with each other in an aqueous dispersion thereof to permit said gelation and thus form a said composition having sufficient stability to degeneration by the heat of said formation to permit good penetration of said composition into said formation; and

maintaining said composition in said formation in contact therewith for a period of time usually sufficient for the acid in said composition to react significantly with the acid-soluble components of said formation and stimulate the production of fluids therefrom.

4,103,743

METHOD AND MEANS OF TREATING WATER WELLS

Dwaine M. Paul, Amarillo, Tex., assignor to Thomas L. Moran, Amarillo, Tex., a part interest

Filed Oct. 29, 1976, Ser. No. 736,693
Int. Cl.[2] E21B *37/00, 43/24, 43/27*
U.S. Cl. 166—299 **6 Claims**

1. The method of treating water wells having a column pipe positioned within a perforated casing and a pump apparatus at the upper end thereof, comprising the steps of:

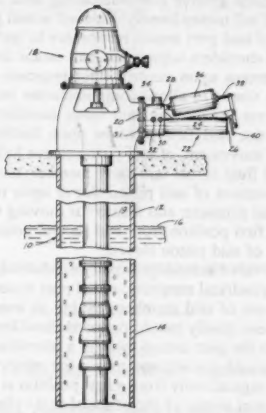
placing a liquid chemical in the column pipe,

sealing the upper end of the column pipe,

injecting compressed air into the upper end of the column pipe,

injecting a combustible mixture of gas and air into the upper end of the column pipe,

and igniting the gas-air mixture whereby the pressure combustion will force a portion of the water and liquid chemical in the column pipe and casing outwardly through the



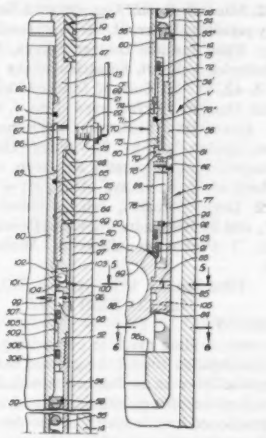
perforations in the casing into the water bearing formation around said casing.

4,103,744

SAFETY VALVE AND BALL TYPE EQUALIZING VALVE

Neil H. Akkerman, New Orleans, La., assignor to Baker International Corporation, Orange, Calif.

Filed Aug. 4, 1977, Ser. No. 821,656
Int. Cl.[2] E21B *43/12*
U.S. Cl. 166—324 **35 Claims**



1. In a subsurface shutoff valve for wells adapted to be supported in a well fluid production pipe: a tubular body having a flow passage therethrough; shutoff valve means including a valve member shiftable between a first position closing said passage and a second position at which said passage is open; actuator means for shifting said valve member between said positions, including a piston sleeve in said body; said piston sleeve and said body defining a control fluid pressure chamber therebetween for moving said piston sleeve longitudinally in said body in one direction in response to the pressure of control fluid in said chamber; equalizing valve means for equalizing well fluid across said valve member upon control fluid responsive movement of said piston sleeve; said equalizing valve

means including by-pass port means in said piston sleeve and by-pass port means in said body, axially spaced shoulders on one of said piston sleeve and said body defining a circumferentially extended groove communicating with one of said port means, and ball means loosely disposed in said groove to seat in the other of said port means responsive to well fluid pressure; one of said shoulders wiping said ball means from said other of said port means upon control fluid responsive movement of said piston sleeve to allow communication between said port means; means for moving said valve member to said second position from said first position upon further control fluid responsive movement, of said piston sleeve following equalization of well fluid across said valve member; means for effecting return movement of said piston sleeve upon reduction of said control fluid pressure; and means for moving said valve member to said first position from said second position upon return movement of said piston sleeve.

28. In a valve assembly: a pair of relatively longitudinally shiftable cylindrical members; radial port means in each of said members, one of said members having an annular groove defined between axially spaced opposed shoulders and communicating with the port means thereof; a plurality of balls loosely disposed in said groove; and means for relatively shifting said members longitudinally from a first position at which said balls close said port means of the other of said cylindrical members to a second position at which one of said shoulders pushes said balls from the last mentioned port means and fluid can flow through said port means and said groove.

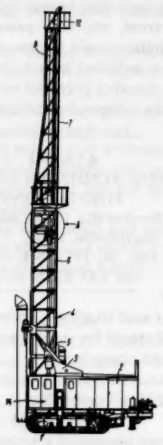
4,103,745

PORTABLE DRILLING MACHINE

Mikhail Sidorovich Varich, ulitsa Mosfilmovskaya, 25, kv. 58; Vladimir Konstantinovich Grigoriev, 1 Streletsky pereulok, 3, kv. 24, both of Moscow; Viktor Dmitrievich Chugunov, Solnechnogorsky raion, Povarovo, poselok 2, 4, kv. 13, Moskovskaya oblast; Alexei Pavlovich Dmitriev, ulitsa Udaltsova, 16, kv. 63, Moscow; Boris Nikolaevich Kutuzov, Sirenevy bulvar, 43, kv. 42, Moscow; Rudolf Genrikhovich Shmidt, 2 Spasonalivkovsky pereulok, 16, kv. 91, Moscow; Isaak Emmanuilovich Narinsky, Khimki, ulitsa Leningradskaya, 16, kv. 40; Alexandr Adolfovich Vukkert, Solnechnogorsky raion, Povarovo, poselok 2, 12, kv. 51, both of Moskovskaya oblast; Yakov Isaakovich Shnapir, 3 Pryadilnaya ulitsa, 7, kv. 111, Moscow; Viktor Alexeevich Soldatov, Solnechnogorsky raion, Povarovo, poselok 2, 7, kv. 7; Vladimir Ilich Antoshenkov, Solnechnogorsky raion, poselok Krjukovo, ulitsa Lenina, 29, kv. 59, both of Moskovskaya oblast, all of U.S.S.R.; Pavel Ivanovich Deev, deceased, late of Moskovskaya oblast, U.S.S.R., and by Alexandra Ivanovna Deeva, administratrix, Mytischi, 2 Parkovaya ulitsa, 5, Moskovskaya oblast, U.S.S.R.

Filed Sep. 13, 1976, Ser. No. 722,677
Int. Cl.[2] B25D *17/14*
U.S. Cl. 173—57 **2 Claims**

1. A portable drilling machine comprising: a crawler vehicle; a derrick installed on said vehicle and having longitudinal racks; a vertical traverse mechanism mounted on said longitudinal racks; a power-driven rotating jaw chuck for rotating a drill pipe positioned longitudinally in said derrick in alignment with a drilling axis and mounted in said vertical traverse mechanism, said jaw chuck serving as a traverse mounted in said vertical traverse mechanism, during a drilling operation said chuck grips said drill pipe and during an idle run, when said chuck is unclenched, said chuck and said verticle traverse mechanism regrip said drill pipe, which is now being held by a clamp located in a bottom portion of the derrick, said jaw chuck having a body, a hollow spindle on bearings mounted in said body, said drill pipe passing through said spindle, and jaws installed in radial ports of said spindle, said jaws being mounted on a faceplate surrounding said spindle, said chuck being rotated by means of a flexible coupling having an elastic shell connected to a flange rigidly attached to an outlet shaft of a reducing gear of a drive of a means for rotation of said chuck and to a bush connected through a spline to said spindle; a pulldown unit connected by a flexible transmission with said vertical traverse mechanism and said chuck to feed said drill pipe to the bottom of a hole during a working run of said vertical traverse mechanism and said chuck along said longitudinal racks, and to raise said drill pipe during an idle run;



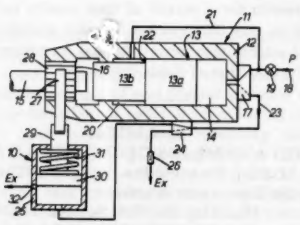
additional racks mounted on said derrick; and a swivel moving along said additional racks, being attached to the top of said drill pipe and connecting said hollow drill pipe with means for feeding a scavenging agent for cleaning cuttings from said hole.

4,103,746

ROTARY AND PERCUSSIVE DEVICES

Lionel Arthur Reynolds, Painswick, England, assignor to A. F. Hydraulics Limited, Chequers Bridge, England

Filed Dec. 13, 1976, Ser. No. 750,161
Claims priority, application United Kingdom, Dec. 23, 1975, 52761/75
Int. Cl.[2] B25D *9/00*
U.S. Cl. 173—107 **9 Claims**



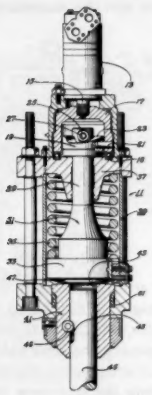
1. A rotary and percussive device comprising means for holding a tool, hydraulic reciprocatory percussive means adapted to impact the tool and having an inlet and an exhaust outlet, said inlet being adapted for connection to a hydraulic pressure supply and the percussive means exhausing through the exhaust outlet at a lower pressure than the supply pressure, and hydraulic rotary drive means adapted to rotate the tool and connected in series hydraulically with said reciprocatory percussive means, said rotary drive means being operated by hydraulic fluid supplied from said exhaust outlet.

4,103,747

BUFFER SPRING FOR AN IMPACT TOOL

James L. Finney, 53 Princeton Arms South, Cranbury, N.J. 08512

Filed Jan. 14, 1977, Ser. No. 759,600
Int. Cl.[2] B25D 9/00
U.S. Cl. 173—119 6 Claims



1. In an impact tool having a housing, a hammer positioned in the housing for axial movement with respect to the housing, a working tool carried in an axial alignment with the hammer for transmitting energy received from the hammer to a workpiece, and means for reciprocating the hammer, the improvement comprising:

a tool guide carried in the housing, having an axial passage for slidingly receiving the working tool, an anvil for receiving blows from the hammer should the working tool be extended so that its end that contacts the hammer is within the axial passage of the anvil, and reduced and expanded cylindrical wall portions separated by a shoulder that faces away from the hammer; and

an annular metal buffer ring encircling the reduced wall portion between the shoulder and an annular internal ledge in the housing; the buffer ring having an inner convex wall portion and an outer concave wall portion, with a selected clearance being provided between the reduced wall portion and the inner wall portion, for allowing the buffer ring to buckle a selected amount, corresponding to an axial movement of the tool guide caused by the blow, thereby absorbing a portion of the energy;

the shoulder being inclined with respect to the axis of the tool, and the buffer ring having a mating inclined surface; the shoulder facing generally the outer concave wall portion to urge the outer edges of the buffer ring against the inner wall of the housing.

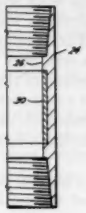
4,103,748

METHOD FOR INHIBITING THE WEAR IN A WELL CASING

James F. Arnold, 6440 Hillcroft, Houston, Tex. 77081

Filed Dec. 10, 1976, Ser. No. 748,889
Int. Cl.[2] E21B 7/04
U.S. Cl. 175—61 10 Claims

3. A method for inhibiting the wear in a well casing, comprising determining the depths within a bore hole of a well where a drill string may contact the well casing, running the casing into the bore hole with one or more hardened wear sections positioned within the casing for ultimate landing at the depths where the drill string may contact the casing and selecting the wear sections for installation in the well casing to have



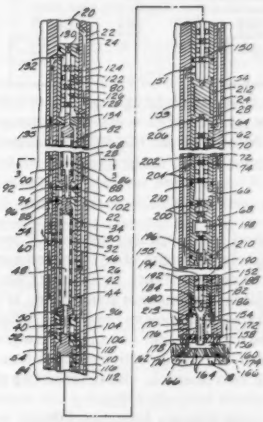
substantially the same internal diameter as the remainder of the well casing.

4,103,749

DOWNHOLE CLEANER ASSEMBLY FOR PETROLEUM WELLS

John W. Erickson, Huntington Beach, Calif., assignor to Kobe, Inc., Huntington Park, Calif.

Continuation-in-part of Ser. No. 746,408, Dec. 1, 1976. This application Feb. 2, 1977, Ser. No. 764,824
Int. Cl.[2] E21B 3/12
U.S. Cl. 175—70 22 Claims



1. A downhole cleaner assembly for a petroleum well comprising:

(a) an elongated housing adapted for receipt in a bore hole of the petroleum well at the base of a drill string;

(b) means for delivering drilling mud to the interior of the housing;

(c) passage means in the housing dividing the drilling mud into a first fluid stream and a second fluid stream, the second stream being delivered to a drilling zone at the base of the bore hole;

(d) cleaner means in the housing for at least partly removing solids from the first stream of the drilling mud and forming a cleansed liquid stream and an exhaust liquid stream containing solids from the drilling mud;

(e) drive means in the housing to drive the cleaner means;

(f) passage means to discharge the exhaust liquid stream containing solids from the drilling mud into an annulus between the housing and the wall of the bore hole to combine with drilling mud there that passed from the drilling zone; and

(g) means for doing useful work with the stream of cleansed liquid in the bore hole.

18. A method for cleaning drilling mud downhole in a petroleum well and doing useful work with a cleansed stream generated by the cleaning comprising the steps of:

delivering drilling mud containing liquid and solid materials down a conduit in a well bore

separating at least a portion of the liquid and solid materials in the well bore into a first cleansed liquid stream having relatively low concentration of solid materials and a second liquid stream having a relatively high concentration of solid materials;

working with at least a portion of the first liquid; and

combining the first and second liquid streams in the bore hole annulus surrounding the conduit.

4,103,750

METHOD OF AND CIRCUIT FOR FORMING SIGNALS FOR DAMPING CONTROL OF AN ELECTRICAL MEASURED-VALUE INDICATOR

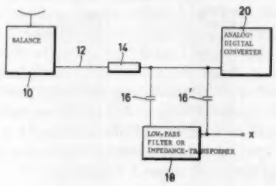
Franz Josef Melcher, Ellierode, and Christian Oldendorf, Gottingen, both of Fed. Rep. of Germany, assignors to Sartorius-Werke GmbH (und vorm. Gottinger Prazisionswaagenfabrik GmbH), Gottingen, Fed. Rep. of Germany

Filed Jan. 12, 1977, Ser. No. 758,852

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1976, 2601150

Int. Cl.[2] G01G *23/10*

U.S. Cl. 177—1 **15 Claims**



1. In a method for producing signals for monitoring the resting or equilibrium position of an electromagnetic precision balance which includes a branch for coupling out a.c. voltages and an active filter or impedance transformer, at the output of which a.c. voltages in a noise range having different frequencies appear, the improvement comprising integrating the a.c. voltages coupled out in respectively equal time intervals to provide at least two integrals, and determining the difference between two of said integrals following one another as a measurement for monitoring the rest or equilibrium position of the balance.

4,103,751

CHECK WEIGHING APPARATUS FOR ARTICLES

Alan Moss, Penketh, Nr. Warrington, England, assignor to Golden Wonder Limited, England

Filed Feb. 17, 1977, Ser. No. 769,383

Claims priority, application United Kingdom, Feb. 19, 1976, 6518/76

Int. Cl.[2] G01G *13/02, 13/24*

U.S. Cl. 177—122 **13 Claims**

1. Check-weighing apparatus comprising,

(a) a conveyor,

(b) receptacle means for receiving articles from said conveyor,

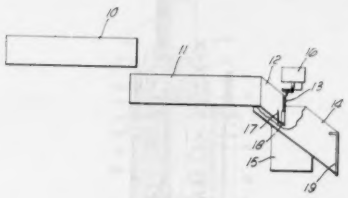
(c) a first gate in the receptacle means for providing an exit for articles from said receptacle means,

(d) a weighing device comprising a weighing pan and means responsive to the weight in said weighing pan, the weighing pan being located beneath the exit from the receptacle means to receive articles therefrom,

(e) means for releasing articles from the weighing pan,

(f) first control means, responsive to the attainment of a predetermined weight of articles on the weighing pan, for releasing the predetermined weight of articles from the weighing pan and for halting the feed of articles to the receptacle means from the conveyor,

(g) second control means for controlling the feed of articles from the conveyor into the receptacle means until a required quantity of articles is attained which is less than the predetermined weight of articles to be weighed by the weighing device, for, responsive to said required quantity being attained, opening the first gate and releasing the required quantity of articles into the weighing pan and for thereafter permitting the conveyor to feed through the receptacle means to top up the articles on the weighing pan to the predetermined weight.



4,103,752

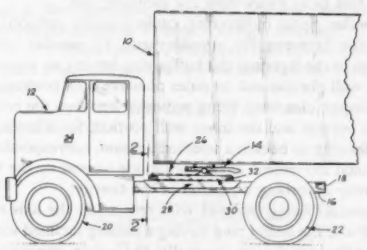
FIFTH WHEEL SCALE APPARATUS

Kenneth J. Schmidt, Thurston, Oreg., assignor to General Trailer Company, Inc., Springfield, Oreg.

Filed Jan. 10, 1977, Ser. No. 758,008

Int. Cl.[2] G01G *19/10*

U.S. Cl. 177—141 **9 Claims**



1. Weighing apparatus adapted for operative interposition between a fifth wheel assembly and a vehicle frame, said apparatus comprising

a mounting subframe adapted for attachment to a vehicle frame,

a rockable subframe pivoted on said mounting subframe and adapted for carrying a fifth wheel assembly,

an expandible-contractible device mounted on said mounting subframe for engagement and disengagement with said rockable subframe, said device, when disengaged from said rockable subframe, being inflatable to engage the same, thereby to cause rocking of said rockable subframe to a condition wherein at least a portion of any load borne by such a subframe is transmitted through said device, and

means operatively connected to said device for producing an indication of the magnitude of any such transmitted load portion.

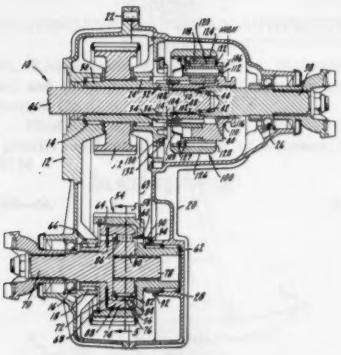
4,103,753
MANUALLY SHIFTABLE PLANETARY GEARSET

John William Holdeman, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 621,194, Oct. 9, 1975, abandoned. This application Jan. 25, 1977, Ser. No. 762,371

Int. Cl.[2] F16H *3/44;* B60K *17/34*

U.S. Cl. 180—49 17 Claims



1. In power transmission apparatus especially adapted for driving a motor vehicle having front and rear ground engaging wheels, said apparatus including a rotary input member adapted for connection to a source of power and rotary output means adapted for connection to said ground engaging wheels, said rotary output means including a pair of spaced primary rotary members coupled to each other for synchronous rotation and providing a driving connection for one of said wheels, and an auxiliary rotary member providing a driving connection for the other of said wheels, said auxiliary member being coupled to one of said primary members by a clutch arranged to permit overrunning of said auxiliary member with respect to said one primary member and to prevent overrunning of said one primary member with respect to said auxiliary member, and means arranged for transmission of power between said rotary input member and said rotary output means selectively in a plurality of drive conditions; the improvement wherein said power transmission means comprises a planetary gear assembly including an input sun gear in engagement with said rotary input member, and a sub-assembly including an output carrier, a ring gear, and a plurality of planet gears in meshing relationship with said sun and ring gears, said sub-assembly being slidable relative to said sun gear to a first position wherein said carrier is in engagement with said sun gear and said rotary output means and wherein said ring gear is not grounded, and to a second position wherein said carrier is not in engagement with said sun gear and is in engagement with said rotary output means and wherein said ring gear is grounded.

4,103,754
PROTECTION OF OCCUPANTS OF A VEHICLE

Roger Anderton Ashworth, Carlisle; John Michael Pollitt, Gretna, and Graham Colin White, Bellinge, all of England, assignors to Kangol Magnet Limited, London, England

Filed Sep. 10, 1976, Ser. No. 722,263

Claims priority, application United Kingdom, Sep. 10, 1975, 37268/75

Int. Cl.[2] B60R *21/10*

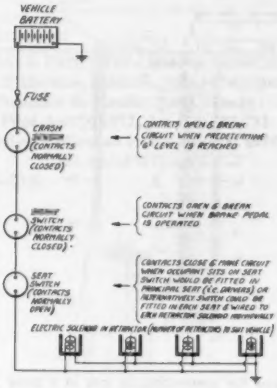
U.S. Cl. 180—82 C 2 Claims

1. A system for protection of occupants of a vehicle having braking means, a driver's seat, and at least one passenger seat, said system comprising:

a plurality of seat belt means each associated with a respective seat and each comprising a seat belt, a seat belt retractor from which the seat belt can be withdrawn for use by the occupant of the seat, lock means operable to prevent withdrawal of the belt from the retractor, biasing means urging said lock means to the operative condition, and solenoid means responsive to the supply thereto of an electric power supply to hold said lock means inoperable against said biasing means,

means connecting said plurality of solenoid means in parallel,

first switch means having switch contacts, means responsive to vehicle deceleration to cause circuit breaking opening of said contacts, and means holding said contacts closed in the absence of said deceleration,


VEHICLE BATTERY
FUSE
CRASH SWITCH (CONTACTS NORMALLY CLOSED)
CONTACTS OPEN & BREAK CIRCUIT WHEN PREDETERMINE 'G' LEVEL IS REACHED
SWITCH (CONTACTS NORMALLY CLOSED)
CONTACTS OPEN & BREAK CIRCUIT WHEN BRAKE PEDAL IS OPERATED
SEAT SWITCH (CONTACTS NORMALLY OPEN)
CONTACTS CLOSE & MAKE CIRCUIT WHEN OCCUPANT SITS ON SEAT. SWITCH WOULD BE FITTED IN PRINCIPAL SEAT (i.e. DRIVERS) OR ALTERNATIVELY SWITCH COULD BE FITTED IN EACH SEAT & WIRED TO EACH RETRACTOR SOLENOID INDIVIDUALLY
ELECTRIC SOLENOID IN RETRACTOR (NUMBER OF RETRACTORS IN SAID VEHICLE)

second switch means having switch contacts, means responsive to operation of said vehicle braking means to cause circuit breaking opening of the last-named contacts, and means holding the last-named contacts closed in the absence of said braking means operation,

third switch means having switch contacts, means responsive to occupation of said driver's seat to close the last-named contacts, and means holding the last-named contacts open when said driver's seat is unoccupied,

electrical power supply means,

and means connecting said first, second and third switch means in series with said parallel-connected solenoid means.

4,103,755
GAS-CUSHION VEHICLES

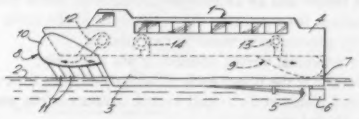
Edward Gunston Tattersall, Southhampton, England, assignor to Hovermarine Transport Limited, Southampton, England

Filed Mar. 28, 1977, Ser. No. 781,815

Claims priority, application United Kingdom, Mar. 29, 1976, 12489/76

Int. Cl.[2] B60V *1/11*

U.S. Cl. 180—117 6 Claims



1. A gas-cushion vehicle provided with first and second fan means operable independently of each other, said first fan means being operable so as to supply vehicle support gas to the cushion, and said second fan means being operable so as to be responsive to changes in cushion pressure, whereby said second fan means acts to supply gas to the cushion as cushion

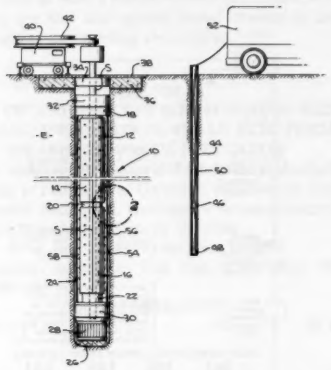
pressure tends to decrease, and to allow excess gas to be released by backflow as cushion pressure tends to increase.

4,103,756

STRESS WAVE GENERATOR

John G. Trulio, Los Angeles, Calif., and Stephan J. Bless, Dayton, Ohio, assignors to Applied Theory, Inc., Los Angeles, Calif.

Filed Dec. 21, 1976, Ser. No. 745,081
Int. Cl.[2] G01V *1/14*
U.S. Cl. 181—121 **34 Claims**



1. Apparatus for generating in situ in a zone of earth surrounding a bore hole longitudinal and shear waves of predetermined relative amplitude, said apparatus comprising a striker having plural individually separable mass elements collectively rotatable at a selected speed within a locus of rotation coaxial with the bore and inward from the bore inner periphery to define a mass element travel space predetermined in relation to said selected rotational speed; means to separate said mass elements from said locus at said selected speed to travel centrifugally outward through said space in timed response to striker rotation and angularly impact said periphery in circularly distributed dragging relation generating longitudinal and shear waves having predetermined relative amplitudes responsive to said relation of travel space, rotational speed, and element areal mass.

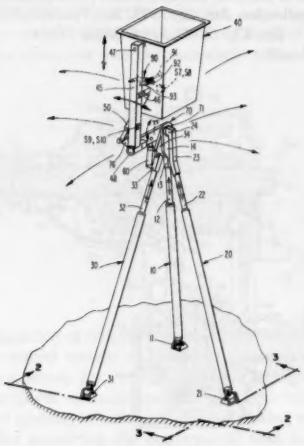
4,103,757

TRIPOD AERIAL LIFT

Arthur K. McVaugh, 2009 Old Sumneytown Pike, Harleysville, Pa. 19438

Filed Jun. 30, 1977, Ser. No. 811,730
Int. Cl.[2] B66F *11/04*
U.S. Cl. 182—2 **16 Claims**

1. An aerial lift apparatus comprising:
a. a man-carrying aerial bucket;
b. a tripod comprising three hydraulic cylinders each having a barrel and an extendable-retractable piston rod;
c. means for mounting the lower ends of the three cylinders for pivotal movement in two planes;
d. a universal vertex connector pin assembly;
e. means at the upper ends of said piston rods for connecting said piston rods to said vertex connector pin assembly;
f. a lateral arm;
g. means for pivotally connecting one end of said lateral arm to said vertex connector pin assembly;
h. a jib boom;
i. means for pivotally connecting the other end of said lateral arm to the lower end of said jib boom;
j. means for pivotally supporting said bucket to the upper end of said jib boom;
k. means for latching said jib boom to said bucket in the vertical plane of said bucket;
l. a hydraulic system including solenoid control valves for each cylinder;



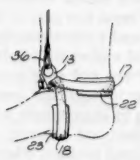
m. an electrical system including manually operable switches for controlling the solenoid valves for selectively and individually controlling the extension and retraction of the piston rods in said three hydraulic cylinders, thereby to control the movement and positioning of the bucket.

4,103,758

SAFETY/TOOL BELT COMBINATION

Lew Himmelrich, P.O. Box 777, San Juan Capistrano, Calif. 92675

Filed Mar. 3, 1977, Ser. No. 773,956
Int. Cl.[2] A62B *35/00*
U.S. Cl. 182—3 **11 Claims**



1. A safety belt assembly comprising:
two connecting rings to be received near opposite sides respectively of a user's body;
a first belt connected at spaced locations to said two rings respectively in a relation forming a rear portion of the first belt adapted to extend across the back of a user's waist between said rings, and forming a seat portion of the first belt which can extend downwardly between the two rings to support the user in essentially a sitting position;
a second belt to extend about the back of the user's waist adjacent said first belt and between said rings; and
buckle means for releasably securing opposite ends of said second belt together to retain said assembly about a user's waist;
said second belt having a portion which is received essentially adjacent said first belt between said rings and toward the back of the user's waist when the assembly is in use, but which is free of direct attachment to the adjacent portion of said first belt in a relation enabling a tool carrier

to be slipped onto and be carried by said portion of the second belt between said rings; and

said rings containing slits slidably receiving said first belt to enable adjustment of the rings along said first belt and consequent adjustment of the relative lengths of said rear portion and seat portion thereof.

4,103,759

LUBRICATING SYSTEM FOR AN ANTIFRICTION BEARING

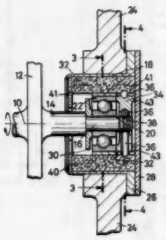
Hans Erich, Kiel-Schulensee; Alfred Jordt, Neumühlen-Dietrichsdorf, and Klaus König, Kiel, all of Germany, assignors to Anschutz & Co. G.m.b.H., Germany

Filed Mar. 4, 1977, Ser. No. 774,313

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1976, 2609736

Int. Cl.² F16N *7/12*

U.S. Cl. 184—64 **7 Claims**



4. The combination comprising a rotary shaft, an inner race ring thereon, an outer race ring surrounding said inner race ring, a set of antifriction elements mounted between said race rings for rolling motion thereon, a supporting member fixed to said outer race ring and provided with at least one cavity, a filling of porous material soaked with a liquid lubricant mounted in said cavity, a wick, means for mounting said wick on said supporting member in contact with said filling and in frictional contact with a cylindrical surface of said shaft located close to one end of said inner race ring, said surface being provided with helical grooves for feeding lubricant from said wick to said inner race ring during relative rotation of said shaft and said supporting member.

4,103,760

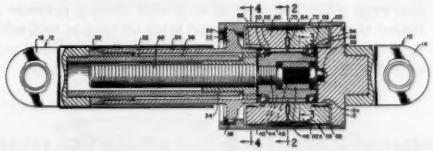
MECHANICAL SHOCK ARRESTOR

Elmer Chensheng Yang, Orange, Calif., assignor to Pacific Scientific Company, Anaheim, Calif.

Continuation-in-part of Ser. No. 776,397, Mar. 10, 1977, abandoned. This application Dec. 30, 1977, Ser. No. 866,097

Int. Cl.² F16F *7/10*

U.S. Cl. 188—1 B **12 Claims**



1. A motion snubbing device comprising:

first and second strut members mounted for relative movement;

a pair of inertia elements rotatably mounted on said first strut member;

a threaded shaft fixed to said second strut member;

a nut mounted on said shaft to be rotated by the shaft when the shaft is moved axially relative to said nut;

means connecting said nut to said elements so that relative movement of said members in one direction will drive one of said inertia elements, and relative movement of said members in an opposite direction will drive the other inertia element; and

means connecting said inertia elements in a manner such that rotating either of the elements below a predetermined motion threshold causes such element to rotate the other inertia element, and attempting to rotate said other inertia element above said threshold initiates braking action on said elements and said members which limits motion to said threshold.

4,103,761

BRAKE FRICTION-LINING SUPPORT

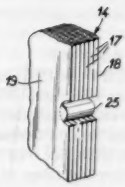
René Gabriel Filderman, Asnieres, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Apr. 7, 1977, Ser. No. 785,752

Claims priority, application France, Apr. 8, 1976, 76 10219

Int. Cl.² F16D *65/02*

U.S. Cl. 188—73.5 **16 Claims**



8. An anti-noise support for a friction-lining of a braking member, in which the lining is fixed to the support and is intended to be applied against a braking surface by operating means acting or reacting on the support over contact area thereof, said support comprising a stack of wholly metallic sheets which are contiguous to each other over their entire facing surfaces and are assembled together by localised assembly means, characterised in that at least some of the said localised assembly means are bonding means provided on peripheral edges of the support.

4,103,762

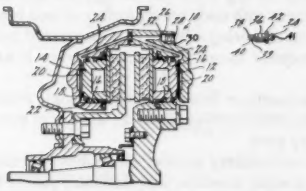
METHOD AND DEVICE FOR REPAIRING DAMAGED BLEEDER VALVE APERTURES

Thomas C. Sawyer, 19435 Lancashire Rd., Detroit, Mich. 48223

Filed Feb. 20, 1976, Ser. No. 659,653

Int. Cl.² B22D *19/10*; B23D *7/00*

U.S. Cl. 188—352 **4 Claims**



1. A repaired disc brake caliper comprising:

a housing having at least one cylinder therein;

a piston movably disposed within said housing;

said housing having a first fluid passage and means for connecting a fluid supply line thereto, said fluid passage conducting a fluid from said supply line connecting means to

said piston so as to cause said piston to move outwardly with respect to said cylinder in response to a flow of fluid thereto;

a second fluid passage in said housing extending from said first fluid passage to the exterior of said housing;

the outer end of said second fluid passage being drilled out so as to form an enlarged diameter portion;

a cylindrical repair sleeve member of substantially constant diameter fixedly disposed within said enlarged diameter portion of said second fluid passage and having a first aperture of a predetermined diameter extending axially inwardly through a portion of said cylindrical member from one end thereof, a second aperture extending axially inward from another end of said cylindrical member, of a diameter smaller than said predetermined diameter and communicating with said first aperture and a valve seat portion disposed between said first and second apertures;

a bleeder valve disposed within said first aperture and adapted to cooperate with said valve seat portion to seal said second passage when in a first position and to allow fluid and entrained air to be expelled from said caliper when in a second position, and

sealing means disposed between the longitudinal surfaces of said cylindrical member and said second fluid passage.

4,103,763

BRAKING DEVICE FOR DRIVE MOTORS

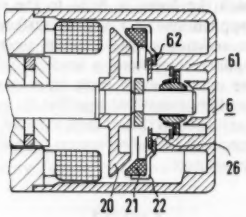
Erhard Glöckner, Eibelstadt, and Anton Wittstadt, Sommerach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 22, 1976, Ser. No. 669,103

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1975, 2513219

Int. Cl.² F16D *3/14*

U.S. Cl. 192—2 **3 Claims**



1. A braking device for use with a drive motor, said motor being of a type comprising a rotor which is axially displaced by a spring force when the motor winding is de-energized, said braking device comprising:

a brake lining having a contact surface;

a brake disk having a contact surface for movement into engagement with said contact surface of said brake lining, said brake disk being adapted to be connected to said rotor for movement therewith when said rotor is axially displaced;

said contact surfaces being formed at an angle relative to the direction of said movement in the manner of a cone brake;

a stationary part;

an elastic intermediary member for resiliently connecting, at least in a radial direction, said stationary part to said brake lining;

a brake lining ring for supporting said brake lining, said brake lining ring being connected to said intermediary member and including prong-like radial projections distributed over its circumference;

and said stationary part having recesses for receiving said prong-like projections.

4,103,764

CONTROL SYSTEM FOR AN AUTOMATIC POWER TRANSMISSION

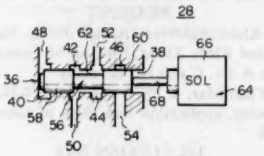
Tetsuya Iijima, Tokyo, Japan, assignor to Nissan Motor Company, Ltd., Japan

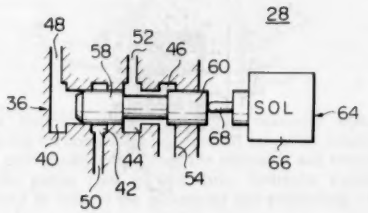
Filed Nov. 10, 1976, Ser. No. 740,712

Claims priority, application Japan, Nov. 12, 1975, 50-135024

Int. Cl.² B60K *21/00*

U.S. Cl. 192—4 A **8 Claims**





1. A control system for an automatic power transmission of a motor vehicle having an engine and means producing a throttle pressure the magnitude of which is substantially proportional to the output of said engine, said transmission including a downshift circuit into which hydraulic fluid from a fluid supply under pressure is introducible for achieving downshift to the next lower vehicle speed gear ratio at relatively high vehicle speed, said control system comprising:

switch means;

a valve member including a valve body and a valve spool slidably held in said body, said valve spool taking first and second positions in said valve body, said first position being one in which said downshift circuit fluidly communicates with said fluid supply to be fed with said hydraulic fluid, said second position being a position in which said downshift circuit fluidly communicates with a drain passage for draining said hydraulic fluid therefrom;

means for maintaining said valve spool of said valve means at said second position when the magnitude of said throttle pressure is higher than a predetermined level;

a solenoid coil electrically connected to said switch means to be energized when said switch means closes; and

a plunger cooperating with said solenoid coil so as to move said valve spool of said valve member into said first position even when the magnitude of said throttle pressure is higher than said predetermined level so long as said solenoid coil is energized in response to close condition of said switch means.

4,103,765

RESILIENT SUPPORT FOR COIL OF VISCOUS FLUID DRIVE

Thomas H. Tinholt, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

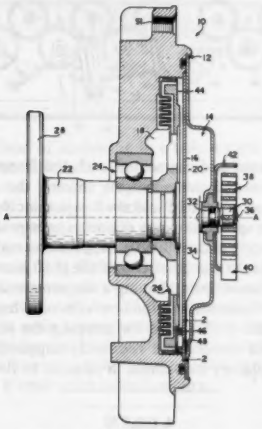
Filed Apr. 5, 1977, Ser. No. 784,897

Int. Cl.² F16D *43/25*; C09J *5/00*

U.S. Cl. 192—58 B **14 Claims**

1. A temperature responsive viscous fluid drive comprising:

a housing member rotatable about an axis and defining a cavity;
a valve plate dividing said cavity into a working chamber and a reservoir;
a clutch member located within said working chamber and rotatable about said axis;
an input shaft secured to one of said members to rotate said one member about said axis and being supported on the other member for relative rotation;
viscous shear fluid in said cavity;
valve means to control fluid communication between said reservoir and said working chamber;



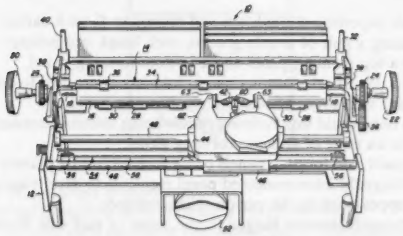
means defining an opening on one of said members;
temperature responsive means controlling said valve means and including a bimetallic member having one end secured to said valve means and another end located in said opening;
retention means located on the other end of said bimetallic member; and
resilient means associated with said retention means to retain said other end in a given position relative to said opening and resiliently restrict radial movement of said other end from said given position.

4,103,766

CONTROL APPARATUS FOR SERIAL PRINTER

Frank D. Ruble, Fremont; Louis H. Chang, and John C. Fravel, both of San Jose, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 682,877, May 3, 1976. This application Jan. 13, 1977, Ser. No. 759,224
Int. Cl.[2] B41J *1/30*
U.S. Cl. 197—62 **2 Claims**



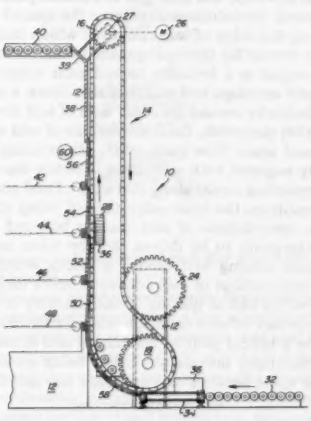
1. A serial printer comprising:
a carriage;
a print member rotatably mounted to said carriage and including a plurality of character elements;
drive means coupled to said print member for rotating said print member to a desired rotational position in order to place a selected character element at a printing position adjacent a record medium to be printed upon;
servo control means coupled to said drive means and responsive to a set of input data and instructions for generating a control signal to control the direction and to regulate the speed of rotation of said print member in order to bring said selected character element to a stop at said printing position; and
programmed data processing means coupled to said servo control means for supplying at least some of said set of input data and instructions under program control to said servo control means, said data processing means comprising a random-access-memory having a first addressable storage location for storing a first position signal indicative of the actual rotational position of said print member relative to a reference location and a second addressable storage location for storing a second position signal indicative of said desired rotational position of said print member, said first and second storage locations capable of being addressed under program control to provide said first and second position signals at the output of said random-access-memory, said data processing means further comprising an arithmetic logic unit responsive to said first and second position signals for calculating the clockwise rotational difference between said first and second position signals under program control, and means responsive to said calculated difference being zero for supplying a disable command signal under program control to said servo control means for disabling same.

4,103,767

ELEVATING APPARATUS

Kent F. Warner, White Plains, N.Y., assignor to W & H Conveyor Systems, Inc., Carlstadt, N.J.

Filed Jan. 25, 1977, Ser. No. 762,366
Int. Cl.[2] B65G *37/00*
U.S. Cl. 198—366 **7 Claims**



1. Apparatus comprising:
(a) an endless conveyor having generally vertically runs, said conveyor having stretchable means for contacting and pushing a package along one of said runs,
(b) an input conveyor means and a discharge conveyor means at different elevations adjacent said one run of said endless conveyor,
(c) a generally vertical, slippery reaction surface along said one run and stationary with respect to said endless con-

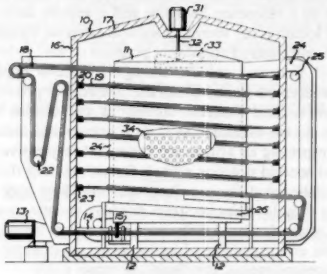
veyor for cooperation with said stretchable means to confine a container as it is moved generally vertically along said one run, said reaction surface being defined by a plurality of panels at least one of which is movable to a position to provide an opening adjacent one of said conveyor means and through which a container can be moved.

4,103,768

CONVEYOR FOR CONVEYING ARTICLES IN A HELICALLY CURVED PATH

Sven Erik Persson, Landsurona, Sweden, assignor to Teknisk Konsult Sven Persson AB, Sweden

Filed Dec. 7, 1976, Ser. No. 748,173
Claims priority, application Sweden, Dec. 17, 1975, 7514249
Int. Cl.[2] B65G *15/62*
U.S. Cl. 198—778 **4 Claims**



1. A conveyor for conveying materials in a helical curved path through a treating zone, comprising at least one conveyor belt, a cylindrical envelope fixedly mounted with its axis in a vertical position and defining the treating zone, a drum mounted coaxially within and spaced from said envelope, means for rotating said drum about its axis, a plurality of spaced supporting means fixed to the longitudinal edges of said conveyor belt, a plurality of projections mounted on the inner face of said envelope and arranged in a helical path thereabout having spaced convolutions to receive the spaced supporting means along that edge of said conveyor which constitutes the outer edge thereof for sliding engagement therewith when said belt is arranged in a helically curved path within the space between said envelope and said rotatable drum, a spacing belt arranged helically around the outer wall of said drum and in a plane parallel therewith, the convolutions of said spacing belt being spaced apart from each other, said spacing belt being frictionally engaged with said drum to rotate therewith, said spaced supporting means along that edge of said conveyor belt which constitutes the inner edge thereof being disposed between the convolutions of said spacing belt and frictionally engaged therewith to be driven thereby when said drum is rotated, said spacing belt having a width which separates adjacent convolutions of said conveyor belt a distance corresponding to the helical spacing of said plurality of projections on the inner face of said envelope whereby the conveyor belt is driven in a helical path by rotation of said drum and is disposed substantially horizontally while being moved helically within the space between said envelope and said drum.

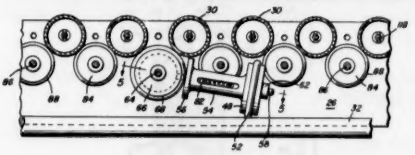
4,103,769

LIVE ROLLER CONVEYOR

Morell L. Jorgensen, Honeoye Falls, N.Y., assignor to Stone Conveyor, Inc. (Entire), Honeoye, N.Y.

Filed Jul. 6, 1976, Ser. No. 703,077
Int. Cl.[2] B65G *13/06*
U.S. Cl. 198—781 **10 Claims**

1. In an accumulating conveyor including a frame and a plurality of transport rollers disposed in adjacent spaced relation and rotatably supported by the frame, the improvement comprising friction drive wheels rotatably supported by the frame in peripheral contact with the rollers for drivingly interconnecting all of the rollers, with each drive wheel being in contact with two adjacent rollers, means driving at least one of said drive wheels for imparting drive torque to the rollers and the other drive wheels, and means supporting said drive wheels from the frame for biasing the drive wheels into driving engagement with the rollers, said means biasing the drive wheels toward the rollers including supporting shaft means for each of said drive wheels with the shaft means being supported from said frame, means engaged with each end of the drive



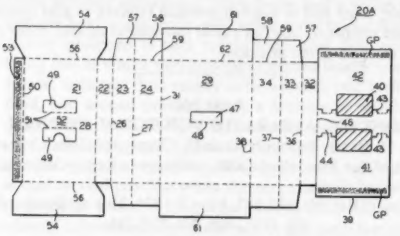
wheel shaft means and connected with the frame for biasing the shaft means and drive wheels toward the rollers, said means at one end of each of said shaft means including a multiple convolution spring having a diameter greater than the shaft means to floatingly and resiliently support one end of the shaft means, the means at the other end of the shaft means including a single convolution spring having a diameter smaller than the shaft means for expansion of the convolution when assembling the spring on the shaft means for gripping the shaft means to prevent rotation thereof and resiliently supporting the shaft means for translatory movement in relation to the frame.

4,103,770

CARTON WITH TRANSVERSE PARTITION AND METHOD OF ASSEMBLING SAME

A. M. Brandenburger, Forest Park, Ill.; C. R. Helms, Collegeville, Pa., and D. F. Barker, Barrington, Ill., assignors to Container Corporation of America, Chicago, Ill.

Filed Dec. 13, 1976, Ser. No. 749,749
Int. Cl.[2] B05D *75/06*
U.S. Cl. 206—193 **2 Claims**



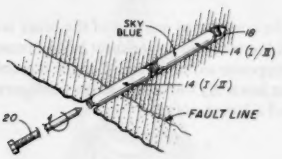
1. A paperboard blank cut and scored to form a carton for enclosing a pair of article groups, each blank comprising:
(a) a top forming panel and a bottom forming panel;
(b) a pair of side forming panels foldably connected to opposite side edges of said bottom forming panel;
(c) one of said side forming panels being foldably connected to an edge of said top forming panel;
(d) said side forming panels being formed from a plurality of hingedly interconnected panel elements to give truncated appearance to the carton when erected;
(e) a web element hinged to the other of said side forming panels along a fold line;
(f) a pair of partition forming elements foldably secured to opposite edges of said web element along hinge lines disposed in normal relationship to said fold line.

4,103,771

DETECTING RESIN CURE

Kenneth G. Klatt, Brown Deer, and Leon D. Robnolt, Jr., New Berlin, both of Wis., assignors to Rexnord Inc., Milwaukee, Wis.

Filed Jun. 11, 1976, Ser. No. 695,099
Int. Cl.[2] B65D 77/08, 31/12
U.S. Cl. 206—219 3 Claims



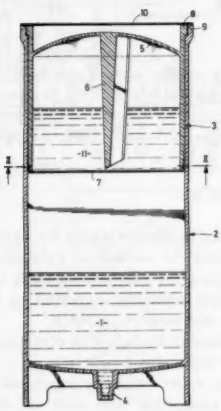
1. In a method of anchoring in a hole a rock bolt by means of rotating the bolt in a resin reaction mixture in the hole including a cross linkable polyester prepolymer reaction constituent which undergoes cross linking by a curing agent through the prepolymer chains and is thereby cured to a hard, infusible thermoset resin, and wherein gelation characterizes the onset of resin cure, the step of inserting and then rotating a rock bolt in the opening in which the reaction mixture has been implanted together with an Oil Blue dye which is distributed throughout the resin but separated from the curing agent in a plastic package ruptured when the bolt is rotated to release the dye which undergoes a color change characterizing the onset of resin cure if resin cure indeed occurs.

4,103,772

SEALED CONTAINER WITH FRANGIBLE PARTITION

Georg Wiegner, Breslauer Str. 35, Viersen 11, Fed. Rep. of Germany (4060)

Filed Sep. 3, 1976, Ser. No. 720,154
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1975, 2539291
Int. Cl.[2] B65D 25/08
U.S. Cl. 206—222 8 Claims



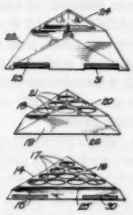
1. A container comprising:
(a) an elongated shell defining a cavity therein,
(1) said shell including two substantially cup-shaped parts defining therein respective, corresponding compartments of said cavity,
(2) each part including two longitudinally terminal, annular portions and a bottom wall adjacent one of said annular portions and remote from the other annular portion,
(3) the bottom wall of each part bounding a corresponding compartment in one longitudinal direction, and
(4) the annular portion remote from said bottom wall bounding a side of the corresponding compartment open in the other longitudinal direction;
(b) first and second, substantially planar, frangible membrane members transverse to said longitudinal directions,
(1) the first membrane member being fixedly sealed to the remote annular portion of one of said parts and closing the open side of the corresponding compartment, whereby said compartments are separated from each other,
(2) the second membrane member being fixedly sealed to the adjacent annular portion of said one part outside said cavity,
(3) one of said membrane members being sealed to the remote annular portion of the other part and constituting fastening means fastening said parts to each other;
(c) a piercing member secured to the bottom wall of said one part in said cavity for joint movement,
(1) said piercing member having a free end portion directed toward said first membrane member,
(2) said bottom wall of said one part being resiliently movable inward of said cavity a distance sufficient to cause piercing of said first membrane member when said bottom wall of said one part is moved; and
(d) releasing means on said shell for directly connecting the compartment defined by the other part to the surrounding atmosphere.

4,103,773

COMBINATION PACKAGE AND RACK FOR POOL BALLS

Terry M. Haber, 3197 B Airport Loop Dr., Costa Mesa, Calif. 92626

Filed Dec. 5, 1977, Ser. No. 857,461
Int. Cl.[2] B65D 85/58
U.S. Cl. 206—315 B 5 Claims



1. A combination package and rack for pool balls comprising, in combination:
(a) a bottom tray having downwardly depending side walls and an upper surface including a first plurality of openings of smaller diameters than the diameters of said pool balls for supporting a majority of said pool balls respectively;
(b) an intermediate tray having downwardly depending side walls positionable on and supported by the marginal edge of said upper surface of said bottom tray, said intermediate tray having an upper surface including a second plurality of openings of smaller diameters than the diameters of said pool balls for supporting the remainder of said pool balls; and
(c) a top tray having downwardly depending side walls positionable over both said bottom tray and intermediate tray to cover the same and having an imperforate upper surface, adjacent marginal wall portions of said top tray and bottom tray including cooperating fastening means for holding said top tray onto said bottom tray, said down-

wardly depending side walls of said intermediate tray functioning as a pool ball rack when separated from said top and bottom trays for properly positioning all of said pool balls in a triangular array preparatory to play.

4,103,774

CAPSULE

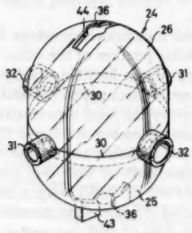
Fusao Shingyouchi, 39-9, Moto-yoyogi, Shibuya-ku, Tokyo, Japan

Filed Jan. 3, 1977, Ser. No. 756,123

Claims priority, application Japan, Jan. 14, 1976, 51-3150[U]; Mar. 15, 1976, 51-30765[U]

Int. Cl.[2] B65D *5/52, 25/24*

U.S. Cl. 206—45.2 **4 Claims**



1. A capsule for containing a commodity, sold by a slot machine, comprising:

(A) a main body defining a holding portion for holding a commodity;

(B) a cover member for covering an opening of said holding portion, said cover member being removable from said main body;

(C) cooperating closure means formed integrally at respective edges of said main body and said cover member for enclosing said holding portion of said main body by said cover member to prevent said commodity from dropping out of said holding portion through said openings; and

(D) independent combining means for connecting said main body with said cover member in such a condition that the opening of said holding portion is exposed and not covered with said cover member, said combining means also being adapted to connect a plurality of said capsules with each other in such a condition that the opening of said holding portion is covered with said cover member by means of said closure means,

said combining means comprising an oblong opening and a ridge dimensioned to be received by said opening, said capsule being usable as a container for coins when said opening of said holding portion is enclosed with said cover member by said closure means, said oblong opening permitting the insertion of coins into said holding portion, said ridge being formed on the bottom of said main body, and said oblong opening is defined by said cover member, said capsule being usable as an egg stand when said ridge is received in said oblong opening, said holding portion of said main body serving to hold an egg and said cover member comprising a base for said main body.

4,103,775

FOUR-CORNERED FLAT WRAPPING

Albert Emiel Smolderen, Aartselaar, Belgium, assignor to AGFA-GEVAERT N.V., Mortsel, Belgium

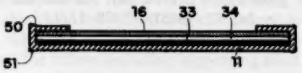
Division of Ser. No. 174,807, Aug. 25, 1971, Pat. No. 3,782,067. This application Oct. 1, 1973, Ser. No. 402,164

Claims priority, application United Kingdom, Aug. 26, 1970, 41126/70

Int. Cl.[2] B65B *9/02*

U.S. Cl. 206—455 **2 Claims**

1. A film sheet wrapping for flat contents which includes at least one radiographic film sheet, said wrapping comprising a first sheet of wrapping material at one side of said contents, and a second sheet of wrapping material at the other side of said contents, one of said wrapping sheets being larger than the other along two opposite sides and having the margins on such sides folded inwardly over the contents into parallel contacting



relation to the contiguous margins of the other wrapping sheet and adhered thereto, said larger sheet being creased along each of the two opposite exterior folded edges thereof to impart to such edge an inwardly curved concave configuration between an upper and a lower corner.

4,103,776

INSPECTION MACHINE FOR FUEL PELLETS

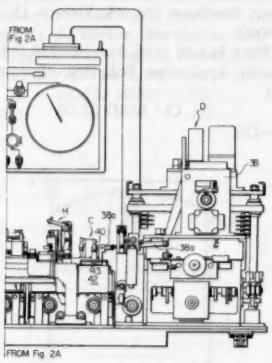
Tadashi Taniguchi, Kawagoe; Takeshi Miyaoka, Sayama; Daiji Hagino, Tokorozawa; Ken-ichi Matsumoto, Naka; Kazuo Sakamoto, Higashi-Ibaragi; Akira Matsuda, Nakaminato, and Toshio Shishido, Naka, all of Japan, assignors to Citizen Watch Company Limited and Doryokuro Kakunenryo Kaihatsu Jigyodan, both of Tokyo, Japan

Filed Sep. 10, 1976, Ser. No. 722,241

Claims priority, application Japan, Sep. 16, 1975, 50-111870

Int. Cl.[2] B07C *1/10*

U.S. Cl. 209—73 **8 Claims**



1. A cylindrical inspection station for an inspection machine adapted to detect the surface of cylindrical pellets, which inspection machine has a supporting block comprising:

a pair of rollers rotatably supported on shafts mounted in parallel to said supporting block;

a lifting mechanism including an arm formed with a groove to support each of said pellets;

an additional roller rotatably supported by said arm for rotatably supporting said each of the pellets in said groove;

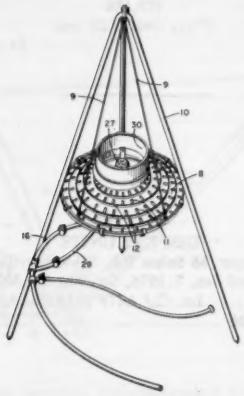
said arm being movable to a position to cause an outer surface of said each of the pellets to come into contact with each of said rollers of said pair of rollers such that said each of the pellets is held at a predetermined position; and

means for detecting flaws in an outer periphery of said each of the pellets by utilizing changes in pressure caused by the contact of an air stream with said flaws.

4,103,777
VIBRATING DISC SEPARATOR

Victor Harold Goulter, via Tabulam, Jackson's Flat, N.S.W., 2470, Australia

Filed Aug. 25, 1975, Ser. No. 607,704
Claims priority, application Australia, Oct. 15, 1974, 367/74
Int. Cl.[2] B03B *5/04, 7/00*
U.S. Cl. 209—43 9 Claims

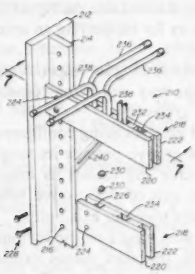


1. A separator for mixed solid particulate materials comprising, in combination, a generally circular member having a raised central input region for said materials and a lower output region along the outer edge, said member having a plurality of riffles disposed upon the upper surface thereof and defined by a plurality of annular baffles, each having a plurality of short radially extending walls with the length of the riffles being greater near the edge than near the center, means for vibrating said member, means for admitting irrigating liquid near said input region, the arrangement being such that said riffles progressively capture and retain a substantial proportion of the heavier components of said materials, while a substantial proportion of the lighter components of said materials is progressively washed clear of said member at said output region.

4,103,778
DISPLAY RACK

Gary W. Bradshaw, 1313 Rae St., Mt. Morris, Mich. 48451

Continuation-in-part of Ser. No. 506,219, Sep. 16, 1974, abandoned. This application Mar. 1, 1976, Ser. No. 662,445
Int. Cl.[2] A47F *7/16, 7/19*
U.S. Cl. 211—47 4 Claims

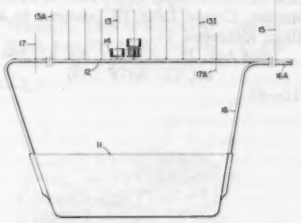


1. a free standing display device, comprising:
(a) a pair of spaced apart upstanding support posts,
(b) an inwardly directed support brace connected to each support post, each brace extending along the length of the associated post, each brace having a plurality of throughbores along the extent thereof,
(c) at least one support member extending between the support posts, the support member being vertically positionally adjustable between the support posts, the support member comprising:
(1) a pair of spaced apart bodies, the inner surfaces of the ends thereof abutting against the opposed lateral sides of the braces,
(2) a plurality of spacers equidistantly spaced apart and disposed between the spaced apart bodies, the spacers defining a plurality of adjacent gaps along the extent of the support means,
(3) the ends of each body having at least one aperture, the apertures of one end being in registry and alignable with any one of the throughbores of the brace associated therewith,
(d) a plurality of display rods frictionally retained by the support member in the gaps, and
(e) means for connecting the ends of the support member to the support braces, the connecting means comprising fastening means, the fastening means being insertable through the registering apertures and associated throughbores, and wherein the fastening means, registering apertures and throughbores cooperate to render the support means vertically positionally adjustable.

4,103,779
BRUSH TENDER

Jerome Wagner, New York, N.Y., assignor to Harry Fraider, New York, N.Y.

Filed Apr. 26, 1976, Ser. No. 680,378
Int. Cl.[2] A47B *81/02*
U.S. Cl. 211—65 2 Claims



1. A brush tender including a receptacle, a stem holder, a plurality of stems, and a plurality of spring-type clamping devices, wherein the improvement comprises the stem holder disposed horizontally above, and functionally connected to, the receptacle, the stems disposed in spaced relation along the upper surface of, and functionally connected perpendicular to, the stem holder, at least one clamping device removably mounted on at least one stem, whereby, at least one brush may be releasably held above the receptacle by the at least one clamping device.

4,103,780
BILLIARDS CUE HOLDER

John W. Winfree, Jr., 1502 S. Virginia St., Hopkinsville, Ky. 42240

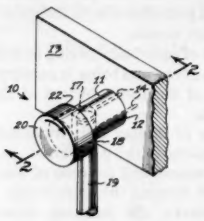
Division of Ser. No. 639,895, May 19, 1976, Pat. No. 4,079,839. This application Jul. 18, 1977, Ser. No. 816,544
Int. Cl.[2] A47F *5/00*
U.S. Cl. 211—68 2 Claims

1. A holder for a billiards cue having a tip portion, comprising:
(a) a body member comprising a bottom portion and a vertical hole in said bottom portion having a diameter slightly larger than a cue tip portion, one side of said hole defining

a fixed jaw element adapted to engage one side of the tip portion of said cue in a position suspended from said body member,

(b) said body member further comprising an externally threaded, cylindrical end portion, including the opposite side of said hole,

(c) a movable jaw element having an internally threaded portion receiving and threadedly engaging said cylindrical end portion for threaded movement toward and away from said fixed jaw element,



(d) said movable jaw element having an annular jaw face in a plane substantially normal to the rotary threaded axis of said movable jaw element, said jaw face being movable across said hole to squeeze the cue tip portion against said fixed jaw element in a suspended position,

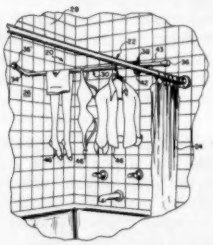
(e) support means adapted to mount said body member at a predetermined elevation to provide the sole means of support of the cue in said suspended position.

4,103,781

PORTABLE ADJUSTABLE CLOTHES DRYING DEVICE

John R. Sterling, Crystal Lake, Ill., assignor to John Sterling Corporation, Richmond, Ill.

Filed Aug. 25, 1977, Ser. No. 827,554
Int. Cl.[2] A47F *5/00*
U.S. Cl. 211—86 **1 Claim**



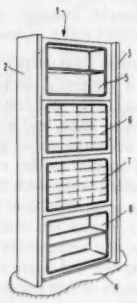
1. A lightweight, portable clothes drying rack adapted to be removably erected over a shower or bath tub enclosure to extend between a horizontal shower curtain rod and an opposing wall of the enclosure, comprising: a unitary elongated tubular member formed with a linear body portion having one end thereof bent angularly outward to provide an upturned end portion extending at substantially 45 degrees relative to said body portion, said upturned end portion being operationally engagable with said opposing wall at an elevation above said body portion and the latter overlying said curtain rod and extending horizontally toward said wall in operation; a protective cap member mounted over the open end of said upturned end portion for frictionally engaging said wall, and a unitary resiliently flexible stop member mounted on said body portion; said stop member being substantially triangular in shape with a central opening for the passage of said body portion therethrough and of a size to produce relatively tight frictional engagement therewith while affording selective positioning of said stop member along said body portion whereby to accommodate variations in the shower curtain rod to opposing wall distance; and a depending lobe portion on said stop member for abuttingly engaging said curtain rod, the abutting engagement of said lobe portion serving to flex the stop member and resiliently deform said opening therein whereby to frictionally lock said stop member to said body portion and frictionally couple the latter to said curtain rod.

4,103,782

DISPLAY UNITS

Raymond E. Mayer, 88 Salem Rd., Schwenksville, Pa. 19473

Filed Jun. 7, 1976, Ser. No. 693,309
Int. Cl.[2] A47F *3/14*
U.S. Cl. 211—126 **5 Claims**



1. A composite merchandise display and simulated building unit comprising:

a pair of side supports comprising elongated panels standing upright on a floor and the panels extending generally parallel one another;

on each panel, a retaining groove co-extensive with the panel and the grooves being formed on the sides of the panels which face one another;

a plurality of display trays extending between said panels, the trays being stacked one on top of the other;

means on each tray for supporting an article to be displayed and/or stored;

in each tray, a pair of tongues respectively formed on opposite sides of the tray and being respectively disposed in said retaining grooves;

said tongues and grooves being configured and dimensioned whereby each groove permits its tongue to slide axially along the groove and retains its tongue against motion transverse the axis of the groove whereby to hold the panels and trays together as a unit;

for each tray, a skirt means on the bottom of the tray below the front wall, the skirt means extending downwardly from the front wall and being offset to the rear;

for each tray, means on the top of the tray for use in being engaged by the skirt on the adjacent upper tray; and

as between adjacent trays, the skirt on the upper tray engaging said means on the lower tray, said means providing vertical support for the upper tray.

4,103,783

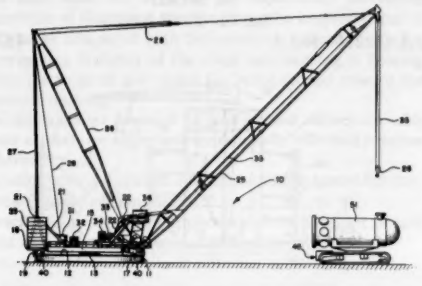
PLATFORM CRANE WITH COUNTERWEIGHT AND BOOM CARRIER SUPPORT LINKAGES

Daniel E. Beduhn; James G. Morrow, Sr., and David J. Pech, all of Manitowoc, Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

Continuation-in-part of Ser. No. 801,597, May 31, 1977, abandoned, which is a division of Ser. No. 709,451, Jul. 28, 1976, Pat. No. 4,042,115. This application Nov. 25, 1977, Ser. No. 854,479

Int. Cl.² B66C *23/72*

U.S. Cl. 212—48 **2 Claims**



1. In a crane assembly, the combination comprising, a ring defining an annular track, an elongated platform mounted for rotation on said ring, said platform having a boom carrier extending at one end therefrom and having roller means in riding contact with said track and a counterweight support means for supporting a counterweight at the other end also having roller means in riding contact with said track, a first set of links defining a triangular frame substantially rigidly interconnecting said counterweight support means and said platform, a second set of links defining a triangular frame substantially rigidly interconnecting said boom carrier and said platform, whereby said platform, counterweight support means and boom carrier are supported as a unit for rotation on said ring said second set of links defining an open, uncluttered region between said platform and said carrier for passage and guidance of rigging, a boom pivoted on said carrier over said track, a cushioned boom stop secured at an upper portion of said second set of links for arresting rearward tilting of said boom beyond a predetermined angle, a mast pivoted on said carrier over said track, a mast strut supported by said first set of triangular links for arresting rearward tilting of said mast beyond a predetermined angle, and a stay interconnecting a central portion of said mast strut and said mast.

4,103,784

SINGLE LINE, TRACTION DRIVEN RUNNING SKYLINE SYSTEM

Michael J. Gonsior, Missoula, Mont., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 29, 1977, Ser. No. 792,366

Int. Cl.² B66C *21/00*

U.S. Cl. 212—94 **11 Claims**

1. A traction driven cable transportation system comprising:

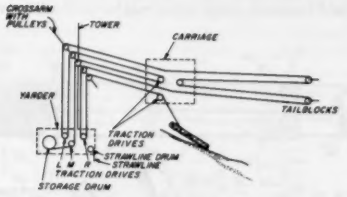
(a) a yarder containing:

(1) Three traction drives (a left, a middle, and a right traction drive) each of which may be driven, without regard to the manner in which the others are being driven, either clockwise or counterclockwise, or may be prevented from rotating by brakes; and

(2) a storage drum, upon which a slight clockwise rotational force is maintained such that when the system calls for cable this force can be readily overcome enabling line to be withdrawn from the drum, but when cable is being released from the system the storage drum readily accepts it; which is distinct from any power drives enabling great variation in the dimensions of said drum and thus great variation in the amount of line which can be stored on said drum;

(b) a yarder tower;

(c) a carriage which contains an upper traction drive and which is designed to pass an intermediate support;



(d) a source of power;

(e) tailblocks;

(f) a single line which constitutes a support member for said carriage, a hauling cable for said carriage and a haulback line for said carriage; and

(g) anchorages for said yarder and said tailblocks; and

(h) a strawline, drum, and tower for rigging purposes.

4,103,785

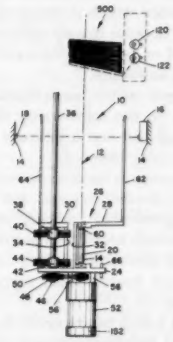
APPARATUS FOR ROTATING AND DISCHARGING ARTICLES

Raymond L. Wiseman, 1550 S. Macon St., Aurora, Colo. 80012

Filed Aug. 18, 1976, Ser. No. 715,430

Int. Cl.² B65G *57/16*

U.S. Cl. 214—6.5 **26 Claims**



1. In an article stacker, in combination:

a turntable;

means for depositing articles on said turntable such that they form an initial stack of articles;

means for rotating said turntable through a half circle;

means for depositing a further quantity of articles such that they form an extension of said initial stack; and cooperate therewith to define an extended stack;

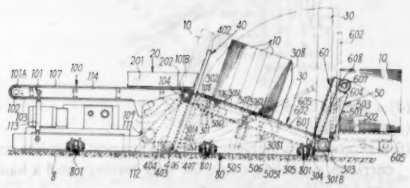
pushing means extending the full height of the extended stack of articles for pushing same from said turntable; and

said pushing means being carried by said turntable and being rotatable therewith during formation of the extended stack and being movable relative thereto for pushing the extended stack therefrom.

4,103,786
BOARD PILING-UP APPARATUS

Masateru Tokuno, Nishinomiya, Japan, assignor to Rengo Co., Ltd., Osaka, Japan

Filed Aug. 6, 1976, Ser. No. 712,046
Claims priority, application Japan, Oct. 11, 1975, 50-136109
Int. Cl.[2] B65G 57/28
U.S. Cl. 214—7 15 Claims



15. Board piling-up apparatus wherein boards, such as corrugated boards, which are individually fed lying flat or in the form of small bundles and which are collected in an erected posture, the collected boards being subsequently turned to be piled up, and thereafter the piled up boards are discharged, said board piling-up apparatus comprising:

a first conveyor which receives said boards fed lying in a flat posture and on which said boards are erected;

an arranging device which is disposed on one side of said first conveyor in order to push against the side ends of said boards erected on said first conveyor and to thus position said side ends uniformly;

a second conveyor which has a board support capable of reciprocating on the transferring side of the conveyor between a feed end and a delivery end in combination with a transporting member;

said second conveyor is inclined downwardly from the feed end thereof to the delivery end: and

said transporting member and said support intermittently receive said boards erected on said first conveyor until a predetermined number is reached, and thereafter continuously feeds said boards while supporting them by said board support;

a stopper device which can protrude straightforward from a position below said first conveyor to above said delivery end of said first conveyor at substantially the same time as the start of said continuous feeding operation of the second conveyor and then continues to protrude until said board support returns to the position for starting the next board receiving operation in order to support said boards erected on said first conveyor;

a piling-up device which has a scooping bed and a piling-up bed extending from said scooping bed substantially perpendicularly thereto;

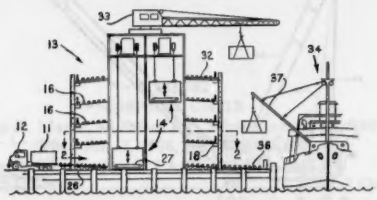
said scooping bed lifts and turns boards which are fed to a predetermined position by said second conveyor and piles them up on said piling-up bed; and

a device which discharges said boards from said piling-up bed.

4,103,787
CONTAINER HANDLING STRUCTURE

Charles R. Salloum, 120 Ellis St., Apt. 307, San Francisco, Calif. 94102

Division of Ser. No. 553,600, Feb. 27, 1975, Pat. No. 4,023,687, which is a continuation-in-part of Ser. No. 287,750, Sep. 11, 1972, abandoned, which is a continuation of Ser. No. 52,381, Jul. 6, 1970, abandoned, which is a continuation-in-part of Ser. No. 720,952, Apr. 12, 1968, Pat. No. 3,613,909, which is a continuation-in-part of Ser. No. 404,622, Oct. 19, 1964, Pat. No. 3,378,151, and a continuation-in-part of Ser. No. 646,671, Jun. 16, 1967, Pat. No. 3,382,990. This application May 16, 1977, Ser. No. 797,422
Int. Cl.[2] E04H 6/06
U.S. Cl. 214—16.1 A 4 Claims



1. A container storage system comprising

a building structure defining a plurality of vertically spaced storage levels

at least one annular rotary-mounted storage platform at each level with each platform having a plurality of circumferentially spaced storage spaces extending radially across the platform and each space having rollers rotatably mounted laterally thereacross for facilitating the movement of a container into and out of the space, said storage spaces each having a radially inclined floor,

a plurality of elevators extending vertically through said structure in a central core within the annular platforms and said elevators opening outwardly directly onto a storage platform at each of said storage levels at the upper end of the storage spaces of the platform adjacent said central core, each of said elevators having controllably operable conveyor means on the floor thereof for horizontal movement of a container into and out of an elevator,

controllably operable unloading means at each of said levels having controllable drive means mounted on said structure in alignment with at least one elevator at each storage level and an element movable thereby for engaging a container disposed in a storage space aligned with an elevator and urging the container toward and at least partially into the elevator onto the conveyor thereof whereby the container may be drawn into said elevator, and

controllable drive means for rotatably indexing said storage platforms to align any desired storage space with a selected elevator whereby all storage spaces may be loaded and unloaded in any desired order.

4,103,788
APPARATUS FOR DISCHARGING FROM A SILO

William H. Sutton, P.O. Box 18793, Fort Worth, Tex. 76118

Filed Jun. 23, 1977, Ser. No. 809,293
Int. Cl.[2] B65G 65/46
U.S. Cl. 214—17 DA 1 Claim

1. A silo and unloader combination comprising:

a. a silo having a substantially horizontal floor with a central opening therewithin and having a cylindrical wall extending above said floor and connected therewith;

b. a pit at said central opening for receiving silage and the like from within said silo responsive to a radial sweep auger moving said silage toward said central opening;

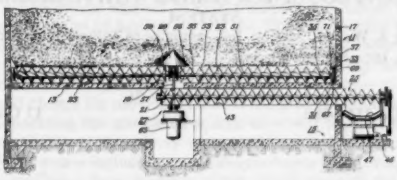
c. removal means extending from said pit radially outwardly exteriorly of the cylindrical wall of said silo;

d. at least one radial sweep auger having its interior end adjacent said pit and having its interior end adapted for connection with a rotation means for effecting rotation about the longitudinal axis of said auger; said auger having its exterior end near said cylindrical wall of said silo; said radial auger having a tapered central shaft that is larger adjacent its exterior end than adjacent its interior end and having substantially uniformly spaced flights of auger blades extending rotationally and peripherally exteriorly of said shaft for drawing in respectively increasing amounts of silage and the like along the interiorly spaced flights as compared with the exteriorly spaced flights for preventing bridging of the silage and keeping it flowing into the front of said auger for being moved toward the central opening;

e. rotation means disposed in said pit and connected with said at least one auger and operationally effecting rotation thereof;

f. housing means disposed over said rotation means for protecting said rotation means;

g. track means disposed peripherally about the floor of said silo and adjacent said cylindrical wall;



h. advancing means connected with the exterior end of said at least one auger and engaging said track means; said advancing means including support means supporting a free end of said auger and including a toothed drive means for engaging said track means;

i. torque inducing means for utilizing differential rotational speed between the toothed drive means of said advancing means and the shaft of the auger to generate a torque to cause the auger to move into the silage; said torque inducing means for utilizing differential rotational speed between said toothed drive means of said advancing means and said shaft of said auger comprising a hydraulic reservoir and hydraulic motor means with an output shaft and with its casing connected with said shaft of said auger so as to spin at the same speed as said shaft; said toothed drive means for engaging said track means comprising a sprocket gear that is connected via gear reducer with the output shaft of said hydraulic motor means such that substantially constant torque is developed to force said auger to advance into said silage and the like; and

j. a track clearing means on the exterior end of said auger for displacing material from said track means into the path of said radial auger and off said track means.

4,103,789

UNITIZED LOADING SYSTEM

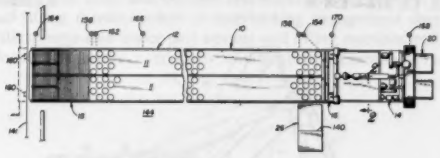
Richard E. Andrews; Ira D. Hooker, both of Arvada, and Daniel R. Simons, Evergreen, all of Colo., assignors to Adolph Coors Company, Golden, Colo.

Filed Mar. 28, 1977, Ser. No. 781,539
Int. Cl.[2] B65G *67/04*
U.S. Cl. 214—41 R **15 Claims**

1. A unitized loader for receiving cargo in relatively small unit loads, indexing the unit loads into a compact total load, moving to extend its front at least partially into a hauling vehicle, delivering the total cargo load into the vehicle, and retracting from the vehicle into a position to receive additional unit loads of cargo, comprising:

(a) a structural framework having fluid bearings supported on its top surface for floating said cargo units and having fluid bearings supported on its bottom surface for supporting the framework for motion on a fluid cushion during extension and retraction of the loader;

(b) pusher means movable between the rear and front of the loader for a first distance for indexing said units of cargo toward the front of the loader into a compact load and for



a second distance for pushing the entire load forward for delivering the cargo into the hauling vehicle;

(c) extension and retraction means for moving the loader forward to deliver cargo into a vehicle and for moving the loader rearward in conjunction with the forward motion of said pusher for removing the loader from under the cargo and depositing the cargo in a compact load in the hauling vehicle; and

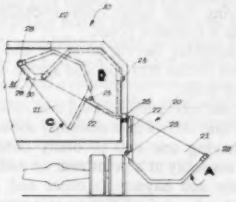
(d) fluid bearing inflating means for selectively providing fluid to the top side and bottom side fluid bearings.

4,103,790

BUCKET ACTUATING LINKAGE

Jacob J. Neufeldt, Box 597, Lethbridge, Alberta, Canada (T1J 3Z4)

Filed Sep. 16, 1976, Ser. No. 723,909
Int. Cl.[2] B60P *1/04*
U.S. Cl. 214—80 **16 Claims**



1. In combination, a bucket for a self-loading refuse vehicle, said bucket operatively connected to a shaft for rotation therewith about an axis, and a linkage means for applying torque to said shaft,

such shaft and bucket being movable through a lifting stroke between a lower position for loading, a raised position for unloading and through a compacting stroke to a further position for compacting wherein the shaft is turned beyond the raised position, and through a return stroke back to said lower position,

said drive linkage means including a plurality of interconnected links, said linkage means connected to the vehicle and to the said shaft and operable, upon powered actuation thereof, to transmit the force of the power actuation to exert a torque on the said shaft to move the bucket through said lift stroke from said lower position to said raised position and then through the compacting stroke to said further position,

said drive linkage means including means for exerting on the shaft, during said lifting stroke, the greatest torque at about halfway between the lower and raised positions, and including means for exerting on the shaft during the

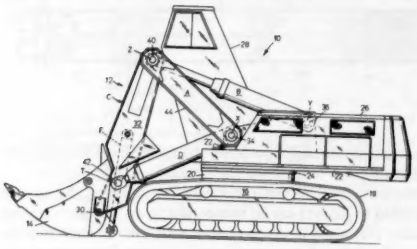
compacting stroke a further torque which is greater than the said torque about halfway through the lifting stroke.

4,103,791

SHOVEL ATTACHMENT MEANS FOR HYDRAULIC EXCAVATOR

Karl Hans Ullmann, Dortmund, Fed. Rep. of Germany, assignor to Harnischfeger Corporation, W. Milwaukee, Wis.

Filed Jun. 3, 1977, Ser. No. 803,356
Int. Cl.[2] E02F *3/30*
U.S. Cl. 214—138 R **8 Claims**



5. In an excavating machine:
a mobile lower section;
a rotatable upper section mounted on said mobile lower section and comprising an upper frame having a working end;
shovel attachment means mounted on said upper frame and comprising:
a stroke arm having its lower end pivotally connected to a first point on said upper frame;
an extendable and retractable stroke arm cylinder for pivotally moving said stroke arm about said first point and having its lower end pivotally connected to a second point on said upper frame, said stroke arm and said stroke arm cylinder having their upper ends pivotally connected to each other at a common point;
a shovel arm assembly having its upper end pivotally connected to said stroke arm and said stroke arm cylinder at said common point;
an extendable and retractable shovel arm cylinder for pivotally moving said shovel arm assembly about said common point and having one end pivotally connected to said shovel arm assembly at a point near an end of said shovel arm assembly and having its other end pivotally connected to a fixed point relative to said upper frame;
and a shovel mounted on said shovel arm assembly near the lower end thereof.

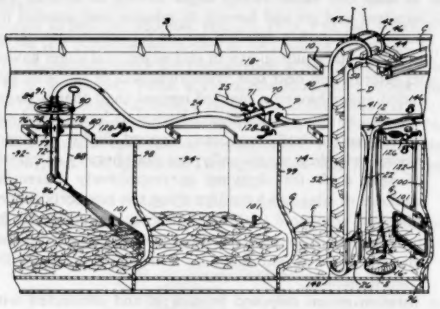
4,103,792

FISH UNLOADING SYSTEM

Mario J. Puretic, 259 6th Ave. North, Tierra Verde, Fla. 33715

Filed Jan. 27, 1977, Ser. No. 762,854
Int. Cl.[2] B63B *35/14*
U.S. Cl. 214—152 **14 Claims**

1. A system of unloading fish from the main fish hold and auxiliary fish holds of a fishing boat through an upwardly opening main fish hold hatch, said auxiliary fish holds being connected to said main fish hold by vertically extending access hatches, said system comprising:
maintaining water in said holds at a level intermediate the elevation of said access hatches;
positioning a generally vertically extending power-driven fish-impelling device within said main fish hold with its lower portion submerged in said water, said fish-impelling device receiving fish at its lower submerged portion and discharging said fish without water upwardly through said main fish hold hatch; and
continually recirculating said water from said main fish hold through said auxiliary fish holds towards said main fish hold and back into said auxiliary fish holds so as to progressively float fish from said auxiliary fish holds through said access hatches into said main fish hold for removal by said fish-impelling device.

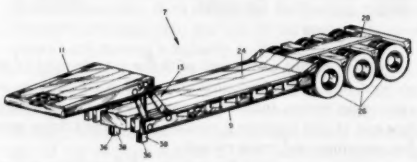


4,103,793

FOLDING GOOSENECK TRAILER WITH POSITIONING SYSTEM

Leslie A. Weaver, Monon, Ind., assignor to Talbert Manufacturing, Inc., Rensselaer, Ind.

Filed May 6, 1977, Ser. No. 794,537
Int. Cl.[2] B60P *1/20*
U.S. Cl. 214—506 **17 Claims**



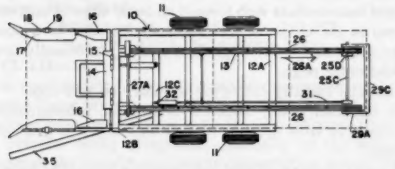
9. A folding gooseneck trailer, comprising:
a main bed having ground engaging wheels at one end portion and frame means defining at least a partial substantially vertical rectangular passage in said main bed at the other end portion;
a loading bed having a king pin mounted on one end portion for adapting said loading bed to be connected with the fifth wheel of a tractor, the other end portion of said loading bed being adjacent to said main bed;
a pair of parallel links each of which is pivotally connected at opposite ends to the other end portions of said main and loading beds so that said loading bed can be raised and lowered with respect to said main bed;
an elongated element having a cross-section smaller than that of said rectangular passage in said main bed so that said element is movable in and constrained to movement in opposite longitudinal directions with respect to said element, said elongated element terminating at the bottom portion in a ground engageable foot;
a clevis plate connected to the bottom portion of said elongated element; and
a power actuated cylinder and piston assembly connected between said loading bed and clevis whereby when said piston is extended said elongated element is extended from said passage in said main bed so that said foot is in ground engagement with said other end portion of said main bed being then held in a raised position with respect to said ground by said cylinder and piston assembly and said parallel links, and whereby said piston is retracted said elongated element is withdrawn into said passage in said

main bed and said loading bed is pivoted with respect to said main bed at said pair of parallel links so that said loading bed can assume a lowered position to act as a ramp for loading and unloading from said main bed.

4,103,794
BALE MOVER

Robert Shaw, Killarney, Canada, assignor to B & K Industries Ltd., Killarney, Canada

Filed Jun. 29, 1976, Ser. No. 700,748
Claims priority, application United Kingdom, Feb. 20, 1976, 06801/76
Int. Cl.[2] B60P *1/38*
U.S. Cl. 214—518 **25 Claims**



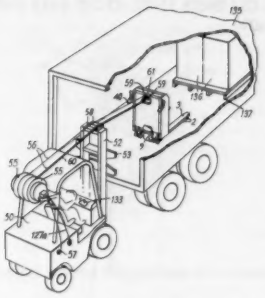
1. A bale mover adapted to load, transport and unload large cylindrical bales of hay, straw and the like and adapted to be towed and operated by a source of power including a source of hydraulic fluid under pressure; said bale mover comprising in combination a substantially rectangular chassis, means mounting said chassis for movement across the ground, hitch means for connecting the associated source of power to the chassis, conveyor means operatively mounted upon said chassis, said conveyor means including an endless conveyor for moving the associated bales from the front of the chassis towards the rear thereof and a pair of arm components pivoted by one end thereof to the front end of the chassis, means on said arm components to detachably engage said components one into each end of an associated bale whereby said bale is clamped between said arms, means to raise said arm components through an arc thereby lifting the associated bale engaged by said arm components, through an arc and depositing said bale transversely upon said conveyor means adjacent the front end thereof, means operatively connected between said arm components and said conveyor means to move said conveyor means incrementally, together with any bales thereon, towards the rear of said chassis each time said arm components are actuated and stop means intermediate the ends of said conveyor means to initially retain the associated bale on the front end of said conveyor means until said conveyor means move rearwardly upon actuation of said arm components.

4,103,795
LIFTING AND LOADING DEVICE

Dennis M. Miller, Andover, England, assignor to Automatic Container Loading Limited, England

Continuation-in-part of Ser. No. 534,446, Dec. 19, 1974, abandoned. This application Jun. 18, 1976, Ser. No. 697,448
Int. Cl.[2] B66F *9/14*
U.S. Cl. 214—621 **30 Claims**

1. The combination of a power deriven lift truck and an auxiliary lifting and loading device wherein said auxiliary lifting and loading device is detachable from said lift truck and is individually operable from said lift truck; the improvement wherein said lift truck is provided with a vertically movable lifting assembly of the type including a lifting member having an upper horizontally extending edge; and said auxiliary lifting and loading device including a horizontally extending lower part having support wheel means and support elements and height adjustment means for raising and lowering said lower part in relation to said support wheel means and said support elements, and a vertically extending upper part connected to said lower part, said upper part having transversely spaced hook elements for vertical movement therewith, said hook elements being configurated for interlocking engagement over said lifting member upper horizontally extending edge for releasably suspending said auxiliary lifting and loading device therefrom, said lifting member upper horizontally extending edge having a rearwardly facing portion which is oblique to a vertical plane and each of said hook elements having a horizontally extending portion and a downwardly extending portion, part of said horizontally extending portion having a downwardly facing surface which is oblique to a vertical plane for engagement over said oblique rearwardly facing portion on said lifting member when in interlocking engagement therewith to urge said upper part against said lifting member, rollable support means carried by said support elements for co-

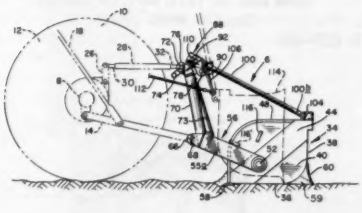


operation with said support wheel means for supporting said auxiliary lifting and loading device independently of said lift truck, means for extending and retracting said rollable support means in response to operation of said height adjustment means for raising and lowering said lower part, a support frame carrying said support wheel means, a lifting frame guidably carried by said support frame, and lift means extending between said support frame and said lifting frame for vertically moving and positioning said lifting frame relative to said support frame, a lower portion of said lifting frame providing said horizontally extending lower part of said auxiliary lifting and loading device and carrying said rollable support means and also having an upper portion which provides said vertically extending upper part of said auxiliary lifting and loading device and carrying said hook elements.

4,103,796
BUCKET ATTACHMENT FOR TRACTORS

Kenneth H. Hare, Rte. 5, Box 334-A, Greenville, Tex. 75401

Filed Jan. 3, 1977, Ser. No. 756,113
Int. Cl.[2] E02F *3/00*
U.S. Cl. 214—766 **11 Claims**



1. Apparatus to attach a bucket to a hitch on a tractor comprising: a bucket having a rear wall and a bottom spaced between two sidewalls; a frame; means securing the frame to the hitch on the tractor; means pivotally securing the bucket to the frame; a sleeve; means pivotally securing the sleeve to the frame; a rod slideably disposed through the sleeve; means pivotally securing a first end of the rod to the upper rear wall

of the bucket such that as the bucket pivots on the frame the rod slides within the sleeve; a stop member pivotally secured over the upper end of the sleeve arranged to limit the upward movement of the rod in the sleeve; means to move the stop member from a position over the upper end of the sleeve and rod to a position away from the upper end of the rod allowing passage of the rod upwardly through the sleeve as the bucket pivots in the frame to dump the contents of the bucket.

4,103,797

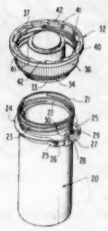
TIGHTLY CLOSED SAFETY CAP AND VIAL

Glenn H. Morris, 4203 Highwood Dr., Chattanooga, Tenn. 37415

Continuation-in-part of Ser. No. 690,962, May 28, 1976, Pat. No. 4,036,385. This application Feb. 10, 1977, Ser. No. 767,288

Int. Cl.[2] B65D *55/02, 85/56;* **A61J** *1/00*

U.S. Cl. 215—209 **9 Claims**



1. In a container, a container body having a mouth provided with internal and external screw-threads, a reversible closure for the container having an externally threaded plug body and an opposite end internally threaded skirt, the threads of the plug body being engageable with the internal screw-threads of the container mouth in one position of use of the closure and the threads of the skirt being engageable with the external screw-threads of the container mouth in a second position of use of the closure, and first and second oppositely facing wedge sealing rings on the closure, one wedge sealing ring engaging the exterior of the mouth of the container in said one position of use of the closure and forcing the internal screw-threads of said mouth into tight compressive engagement with the external threads of said plug body, and the other wedge sealing ring engaging within the container mouth in the second position of use of the closure and forcing the external screw-threads of said mouth into tight compressive engagement with the internal threads of said skirt.

4,103,798

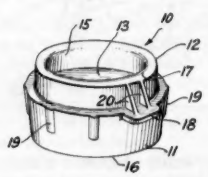
COMBINATION CAP

Richard H. Moeller, Arlington Heights, Ill., assignor to G. M. Tool Corporation, Elk Grove Village, Ill.

Filed Jun. 20, 1977, Ser. No. 808,109

Int. Cl.[2] B65D *51/00*

U.S. Cl. 215—305 **1 Claim**



1. A combination cap to recap a container from which a non-reusable cap has been removed comprising,

a generally cylindrical hollow body having,

a first end having a generally cylindrical inner surface defining a first cup-shaped space and a second end having a general frusto-conical inner surface tapering inwardly toward its open end and defining a second cup-shaped space therein,

said first end and said second end adjacent said first end having substantially the same diameter,

an intermediate web in the form of a relatively thin, circular disk integrally attached at its outer periphery to the inner periphery of said inner surfaces and disposed between said first end and said second end forming a partition between said cup-shaped spaces,

said first end having internal threads thereon for engaging the threaded top of a threaded container,

said second end being adapted to receive an end of a snap-on type container,

the inner surface of said second end tapering inwardly from said intermediate web toward an outer edge of said second end in the shape of the frustum of a cone to a position adjacent said outer edge then curving outwardly toward said outer edge,

an annular radially-extending shoulder on said cap,

said shoulder being disposed in a plane substantially co-extensive with the side of said web adjacent said second end,

the outer surface of said cap tapering inwardly from said shoulder toward an outer edge of said first end and terminating at said outer edge and having a first outside surface formed generally in the shape of a frustum of a cone,

the outer surface of said cap between said shoulder and said outer edge of said second end being in the shape of a cylinder,

a tab integrally attached to said cap and extending radially outwardly therefrom,

said tab having a flat surface forming a continuation of said shoulder and two spaced gussets attached to said outer surface adjacent said second end and attached to the surface of said shoulder and said surface of said tab forming a continuation of said shoulder to a position spaced inwardly from the outside edge of said tab, and circumferentially-spaced, axially-extending ribs on said first outer surface.

4,103,799

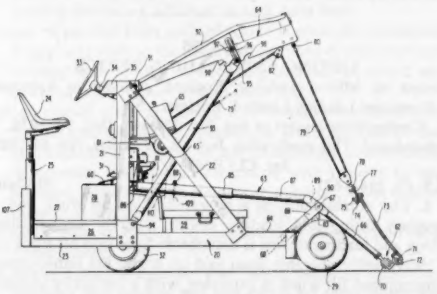
MULTI-PURPOSE WORKING VEHICLE

Hector R. Perez, HN-22 El Comandante Ave., Country Club, Rio Piedras

Filed Jul. 20, 1977, Ser. No. 817,261

Int. Cl.[2] B60P *3/12*

U.S. Cl. 214—86 A **18 Claims**



1. A working machine comprising a wheeled frame including steering and power driving means, a main elevated lifting boom on said frame, winch and cable lifting means associated with the boom, a hitch means and an associated load and hitch positioning means on the wheeled frame substantially below said boom, fore and aft vertically swingable links pivoted to the wheeled frame near its front and sides, common pivot

means connecting the tops of said links with said hitch and positioning means, means on the hitch means forwardly of said common pivot means for lifting the hitch means and adapted for connection with the winch and cable lifting means, said positioning means having a rear end pivoted to said wheeled frame substantially rearwardly of said links and said positioning means including forwardly extensible and rearwardly retractable interfitting parts, and a multi-position abutment element placeable at selected positions on said positioning means and adapted to positively limit retraction of the positioning means while allowing free forward extension of such means.

4,103,800

BACKING MATERIAL

Donald P. Lomax, 706 S. Waterville Lake Rd., Oconomowoc, Wis. 53066, and Ronald M. Boggs, Rte. 1, Box 56F, Mukwonago, Wis. 53149

Filed Apr. 28, 1977, Ser. No. 792,007
Int. Cl.[2] B32B *15/18;* B65D *25/14*
U.S. Cl. 138—145 **2 Claims**

1. In combination, a low alloy nickel-manganese steel cylinder and a lining centrifugally cast onto the inner surface of said cylinder consisting of a wear and corrosion resistant alloy, said steel cylinder being composed essentially of the following elements in the weight percentage composition stated below:

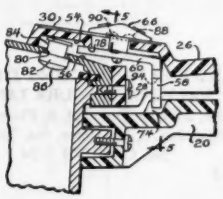
Ingredient	Weight Percent
Carbon	0.18–0.23
Manganese	0.70–0.90
Silicon	0.20–0.35
Chromium	0.40–0.60
Nickel	0.40–0.70
Molybdenum	0.15–0.25
Iron	Balance.

4,103,801

PRESSURE COOKER WITH MANUALLY-OPERATED COVER INTERLOCK

Duane Hubert Walker, Fall Creek, Wis., assignor to National Presto Industries, Inc., Eau Claire, Wis.

Filed Aug. 15, 1977, Ser. No. 824,421
Int. Cl.[2] B65D *51/16, 45/00*
U.S. Cl. 220—203 **12 Claims**



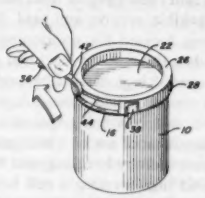
1. A pressure cooker comprising a body having an open top and a cover which removably seals over said open top, said body and cover each having a handle and means which are brought into engagement with rotation of the cover to a position where the cover and cooker body handles align one over the other to secure the cover to the cooker body in a sealed relation, the cover being rotatable out of said position to a further position where said means disengage to permit assembly and removal of the cover; the cover having a vent opening and a sealing plug loosely supported therein which rises through this vent opening to seal the vent opening with pressure buildup in the cooker, and the cover handle having a movable lock which catches with the cooker body handle in one position when the handles are aligned to inhibit rotation of the cover, the lock being movable to a second position where it is free of the cooker body handle to permit cover rotation, the sealing plug when raised through the vent opening being positioned to bar movement of the lock out of its position where it catches with the cooker body handle.

4,103,802

CLOSURE FOR A CONTAINER

Lars-Eric Piltz, Dalby, and Jan-Bertil Jeppsson, Lomma, both of Sweden, assignors to AB Akerlund & Rausing, Lund, Sweden

Filed Nov. 29, 1977, Ser. No. 855,558
Claims priority, application Sweden, Dec. 6, 1976, 7613640
Int. Cl.[2] B65D *51/22*
U.S. Cl. 220—258 **19 Claims**



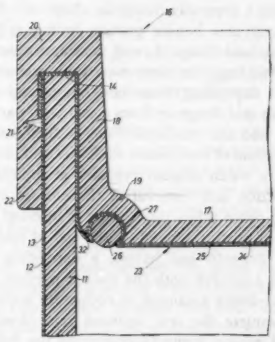
1. A closure for sealing an opening of a container, comprising:
a sealing member for sealing the opening of said container,
a cover to be attached to said container for closing said opening,
means for attaching said sealing member to said container and for supporting said sealing member on the inside surface of said cover,
said cover including a flange attached to the external wall of said container, and
said flange including a weakened area forming a tear strip for removing said cover from said container.

4,103,803

TAMPERPROOF CONTAINER AND CAP ASSEMBLY

Ronald T. Irvine, Leominster, Mass., assignor to Modern Tool & Die Co., Inc., Leominster, Mass.

Filed Apr. 18, 1977, Ser. No. 788,301
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—270 **4 Claims**



1. A tamperproof container and cap assembly including a container having a sidewall with a top rim defining an opening,

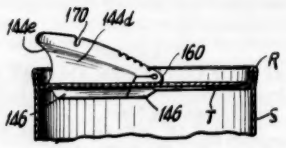
the improvement comprising: a peripheral flange extending radially from the sidewall; a cap comprising a top closure surface, an inner wall, a top wall and an outer wall, said inner wall, top wall and outer wall having an inverted U-shape and being located for engagement with said rim; said outer wall having a distal end which vertically overlies and is located adjacent said container flange when the cap is in its closed position on the container, with the cap and distal end being positioned to prevent access to the cap for removal; said outer wall defining a frangible section having a cross-sectional dimension that is smaller than the cross-sectional dimension of the major portion of said outer wall, a peripheral cap-engaging bead extending radially from said container rim above said peripheral flange; said outer wall defining an internal shoulder for cooperation with said cap-engaging bead and being located intermediate said frangible section and said distal end; said frangible section being located for positioning adjacent said cap-engaging bead when the cap is in its closed position on the container; a pair of spaced lugs carried by said outer wall, a frangible membrane coupling said spaced lugs to said outer wall frangible section, said lugs being spaced a sufficient distance to permit the insertion of a tool which may be operated to force said lugs apart thereby breaking said frangible membrane, with one of said lugs forming a pull tab, said pull tab being operative when pulled to cause removal of the portion of the outer wall between the frangible section and the distal end, thereby allowing access to the cap for removal.

4,103,804

CLAMP ACTION SEALING DEVICE FOR TAB OPENING CANS

Erick-Pierre Fournier, and Ethel V. Hill, both of 30 Park Ave., New York, N.Y. 10016

Filed Oct. 6, 1975, Ser. No. 620,180
Int. Cl.[2] B65D *39/16*
U.S. Cl. 220—281 **7 Claims**



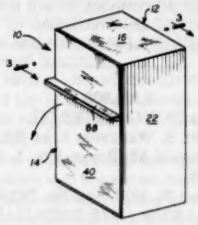
1. A reusable, flexible resilient closure for sealing a can top aperture having a generally triangular shape which comprises: a manually grippable handle portion having a flange at its lower portion, said flange having a shape generally corresponding to but larger in dimension than said can aperture, sealing means depending from said flange and arranged to cooperate with said flange to form a seal with part of said can top aperture; and the handle defining a deep internal cavity open to the bottom of the closure such that said closure may be flexed laterally when manual pressure is applied thereto to facilitate insertion and removal of the closure and to apply lateral sealing force when the closure is inserted in the aperture; an anchor portion hinged to one end of said handle and nestable therebeneath and having a depending sealing lip, which defines a groove with the anchor portion, said sealing lip and groove being arranged to cooperate with said sealing means to complete the seal between said closure and said aperture, said groove being tapered from the free end of the anchor portion to provide a can top entrance, whereby the anchor portion may be slid into and engage the edges of said can aperture and retaining said closure on the can top during use.

4,103,805

CONTAINER

Sidney Silverstein, Flushing, N.Y., assignor to Pearl-Wick Corporation, Long Island City, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,139
Int. Cl.[2] B65D *43/20, 85/56*
U.S. Cl. 220—331 **7 Claims**



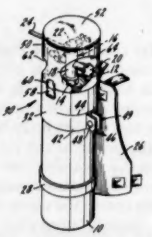
1. A container comprising,
(a) a housing having a top wall, a bottom wall, a rear wall, a pair of side walls and a front opening,
(b) a closure comprising a panel having compartment defining means secured thereto, at the inner side thereof,
(c) cooperating means on said housing and closure for releasably securing said closure to said housing and for permitting said closure to pivotally move with respect to said housing from an opening position thereof in which there is access to said compartment defining means to a closing position thereof in which said panel covers said housing front opening and said compartment defining means is disposed inwardly of said housing,
(d) said compartment defining means comprising a pair of side walls extending from opposite sides of said panel, a top wall and an end wall extending between said side walls, and a front opening opposite said end wall, the bottom edge of said end wall being spaced from the bottom edge of the panel to define a slot therebetween, and
(e) said cooperating means comprising a lip extending upwardly of the front edge of said housing and adapted to be inserted in said slot so as to seat the bottom edge of the end wall within the juncture of the lip and housing whereby said closure is pivotally movable with respect to the housing.

4,103,806

VALVE GUARD FOR PROTECTING THE REGULATOR VALVE ON A SCUBA TANK

E. Vernon White, 2 Circle Dr., Apt. 6, Florence, Ky. 41042

Filed Jan. 3, 1977, Ser. No. 756,324
Int. Cl.[2] B67B *7/24*
U.S. Cl. 222—3 **6 Claims**



1. A valve guard for protecting a regulator valve assembly of an air tank for a self-contained underwater breathing apparatus from damage and abuse during both storage and use, the air tank being of substantially cylindrical configuration and in-

cluding a semispherical end having a boss located centrally thereof with the valve assembly received therein and projecting axially therefrom, the valve guard being releasably secured to and supported solely by the air tank and comprising:

a. an elongate, hollow, cylindrical base portion for receiving the semispherical end of the tank and for engaging the cylindrical portion of the tank adjacent to said semispherical end, said base portion including an upper end terminating in a bearing surface which projects radially of the cylindrical base portion;

b. tightening means carried by the base portion for selectively securing the base portion to the cylindrical portion of the tank by increasing the friction-gripping force therebetween; and

c. a protective cap releasably secured to the base portion and projecting axially outward from the semispherical end of the tank, said cap of hollow, substantially cylindrical configuration conforming to and disposed in alignment with the cylindrical base portion and having a closed outer end for enveloping and shielding the regulator valve assembly, the cap including through apertures in the cylindrical portion thereof for permitting ready access to the regulator valve assembly, said cap being movable between an open, valve-assembly-exposing position and a closed bearing-surface-engaging position, wherein said cap is in abutting engagement with said bearing surface when in the closed position; and

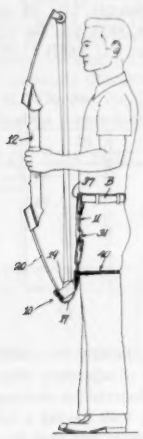
a locking device mounted on said cap for selectively locking the cap in the closed position relative to the base portion.

4,103,807

COMPOUND BOW HOLSTERS

John A. Lyon, 4745 Damon Ave., and Robert E. Whyel, Jr., 819 Rex Blvd. NW, both of Warren, Ohio 44485

Filed Mar. 7, 1977, Ser. No. 774,930
Int. Cl.[2] F41B 5/00
U.S. Cl. 224—1 R 7 Claims



1. An accessory to be worn by an archer for supporting a compound bow which includes a handle, limbs extending from opposite ends of the handle, and a wheel at the end of each limb over which the draw string is trained, the accessory comprising:

a holster of a size and shape to receive one said wheel and the adjoining portion of a limb at one end of the bow, said holster including a pair of flexible straps;

one said strap extending generally vertically and defining a U-shaped curved configuration having upstanding portions and having width sufficient to define a cradle to engage and support said bow wheel and limb, said one strap terminating at one upper end in a connecting portion;

the other said strap disposed generally in a plane transverse to said one strap and inclined from the vertical when said holster is in normal use, said other strap defining a loop respectively connected at generally opposed portions thereof to said upstanding portions of said one strap, one said upstanding portion being disposed adjacent an end of said one strap and the other upstanding portion being disposed adjacent said upper end and between said connecting portion and said cradle;

said other strap thereby defining side guards for the cradle to prevent lateral dislodgement of said bow therefrom, and, supporting means extending from and secured to said one strap connecting portion and including:

(1) adjustable belt strap means for securement to the waist of the archer thereby to support pendently substantially the entire weight of the bow when holstered, and,

(2) detachable leg strap means for securement to the leg of the archer adjacent said holster thereby to maintain said holster substantially laterally stable when so secured,

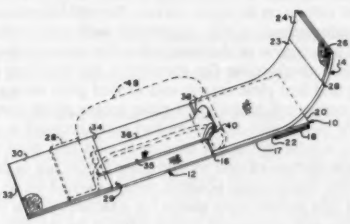
whereby holstering said bow with both said belt strap means and said leg strap means secured provides a substantially rigid bow support for target and like standing position purposes of the archer, while holstering said bow with said belt strap means secured and with said leg strap means detached permits weight support of said bow with lateral flexibility of said holster for transport, crouching, setting and like activities of the archer.

4,103,808

WATCHBAND

Edward L. Hallman, 707 Ridge St., Copperas Cove, Tex. 76522, and Arthur E. Hallman, Jr., 6207 Cricket La., Columbus, Ga. 31904

Filed Aug. 12, 1977, Ser. No. 823,984
Int. Cl.[2] A45C 11/10
U.S. Cl. 224—4 D 1 Claim



1. A watchband comprising:

first, second, and third flaps of relatively flat flexible material meeting along and attached together at a common junction, said second flap being shorter than said third flap;

attachment means extending for a selected distance from adjacent said common junction and positioned on a first side of said first flap for attaching a watch to said first flap;

a first Velcro surface of a first character on said first side of said first flap and extending substantially between an end of said first flap and said attachment means;

a second Velcro surface of a second character extending from the end of said second flap along said second flap, and said second surface of Velcro being on a side of said second flap adapted to mate with said first flap without folding when the first and second flaps together encircle a wrist of a wearer with said first side of said first flap facing outward and said second Velcro surface facing inward;

a third Velcro surface of a second character affixed to an end region of said third flap and being on a side of said third flap,

wherein when said third flap is extended in a first direction over said attachment means, said first and third Velcro surfaces may be engaged and attached without folding;

whereby when said first and second flaps are in an encircling configuration around the wrist, a watch held by said attachment means may be securely covered by said third flap; and

whereby when said third flap is extended in an opposite direction over said second flap, and the end region of the third flap having the third surface thereon is folded back, said third surface and said first surface may be engaged and attached enabling the watch to be viewed without interference from the third flap.

4,103,809

PILOT'S KNEEPAD

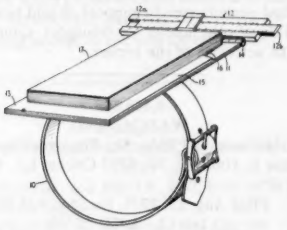
Richard Butler Frost; Joseph Laszlo Juhasz, and Barry Walter Wing, all of Sydney, Australia, assignors to Unisearch Limited, Kensington, Australia

Filed Jun. 7, 1977, Ser. No. 804,433

Claims priority, application Australia, Jun. 15, 1976, PC6275/76

Int. Cl.² A45C *11/00*

U.S. Cl. 224—5 R **4 Claims**



1. A pilot's kneepad comprising, first plate means carrying permanent indicia on an upper surface thereof for use in navigational calculations, means connected with said first plate means for attachment of the kneepad to the upper surface of a seated pilot's thigh to lie flat thereon, a second plate means overlying said first plate means, said second plate means being hingedly connected to said first plate means along one edge thereof for movement of said second plate between a closed position in which said upper surface of said first plate means and a lower surface of said second plate means are in face-to-face relation and an open position, means carried on an upper surface of said second plate means for attachment of a writing pad thereto, and permanent indicia carried on the lower surface of said second plate means for use in navigational calculations whereby said permanent indicia on said upper surface of said first plate means and on said lower surface of said second plate means are readily available for view and use by the pilot when said second plate means is in the open position, and whereby a writing pad attached to said upper surface of said second plate means is in position for use by the pilot when said second plate means is in the closed position.

4,103,810

PACKAGING OF GOODS ON A VEHICLE

Christopher Daniel Dowling Hickey, 5, Heathside, Hinchley Wood, Esher, Surrey, England

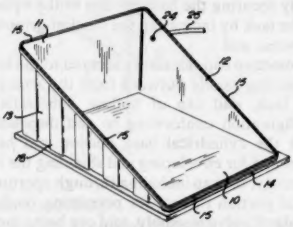
Filed Aug. 13, 1976, Ser. No. 714,285

Claims priority, application United Kingdom, Sep. 18, 1975, 34286/75

Int. Cl.² B60R *9/00*

U.S. Cl. 224—29 R **2 Claims**

1. A vehicle having a container mounted thereon, which container comprises a lower portion having a substantially rectangular base of rigid impermeable material secured to the vehicle, upright front, rear and side walls of rigid impermeable material extending upwardly from the periphery of the base to form a continuous enclosure, the front wall having a uniform height which is greater than the uniform height of the rear wall and the side walls each having a height at the front end equal to that of the front wall and, at the rear end equal to that of the rear wall, the side walls sloping uniformly downwardly along a flat plane from front to rear, said walls having a groove in their top edges forming a continuous channel around the upper edge of said lower portion, said container further comprising



an impermeable flexible envelope having an opening with a periphery of length equal to the length of said channel and adapted to fit in said channel, an inflatable tubular seal on the periphery of the opening in said envelope and extending along the length of the periphery of said opening for effecting an airtight seal between the envelope and said lower portion, and one-way valve means in an air extraction duct through said lower portion to permit of extraction of air from within said container.

4,103,811

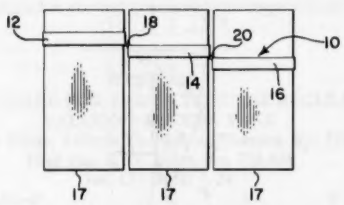
ARTICLE CARRIER AND METHOD OF MAKING SAME

Ronald C. Owen, Harwood Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 360,081, May 14, 1973. This application Oct. 14, 1975, Ser. No. 622,049

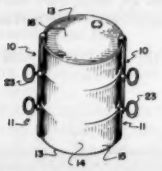
Int. Cl.² B65D *71/00*

U.S. Cl. 224—45 AA **3 Claims**



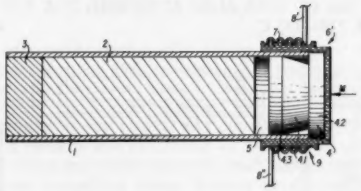
1. A carrier for a plurality of articles such as containers comprising a plurality of adjacently disposed annular sections of flexible expansible material for carrying articles each section having an upstanding wall having a height greater than its thickness but substantially less than its diameter and having upper and lower margins, and junction elements joining adjacent sections to each other along segments of their adjacent margins when said sections are unfolded in side-to-side relationship for carrying said articles, said sections including at least an intermediate section and additional sections adjacent thereto, said junction elements including a first junction element joining the upper margin of said intermediate section with a lower margin of one adjacent section and a second junction element joining a lower margin of the intermediate section with an upper margin of another of said adjacent sections whereby said junction elements provide for axial offset configuration of said sections.

4,103,812
BARREL CARRIER
Henry William Steiner, Box 18, Site 19, R.R. #1, Dryden, Canada
Filed Jun. 17, 1977, Ser. No. 807,543
Int. Cl.[2] B65D *71/00*
U.S. Cl. 224—45 P 1 Claim



1. A barrel carrier for use with barrels having a cylindrical wall with upper and lower rims joining the upper and lower ends of the barrel and the upper and lower ends of the cylindrical wall respectively; comprising in combination a pair of flat, strap type bars, retainer bracket means rigidly attached on each of said bars adjacent one end thereof, each of said bars being slidably engageable within the retainer bracket means of the other of said bars whereby said bars may be adjusted lengthwise one relative to the other, a barrel rim engaging jaw formed intergrally upon the other end of each of said bars, a clamping bolt on each retainer bracket means, operatively engaging between said retainer bracket means and the strap bar slidably passing therethrough, to clamp the bars in the desired relationship, and a hand engaging handle on each of said clamp bolts rigidly secured thereto, to actuate said clamp bolts and to assist in the grasping of said carrier to lift the barrel to which said carrier is attached.

4,103,813
SEALING OF CONTROLLED-ATMOSPHERE CONTAINERS BY MAGNEWELDING
René Pierre Debeir, Osmate (Varese), Italy, assignor to European Atomic Energy Community (Euratom), Luxembourg
Filed Aug. 20, 1976, Ser. No. 716,351
Claims priority, application Luxembourg, Aug. 21, 1975, 73231
Int. Cl.[2] B23K *21/00*
U.S. Cl. 228—2.5 5 Claims

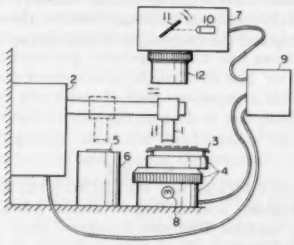


1. A sealing cap for facilitating the magnewelding of the end of a tubular container by means of an exploding coil, said cap comprising:

a tubular wall structure and an end surface, said tubular wall structure and said end surface being made of elastic material and defining said cap and being adapted to be force-fitted over said end of said tubular container in a tight-sealing relationship therewith;

said tubular wall structure including a plurality of circumferential grooves containing therein windings of said exploding coil, said grooves serving to fix the number of windings surrounding said tubular wall structure, the relative spacing of the windings and the pitch of said windings, said grooves further serving when said cap is force-fitted over said end of said tubular container to fix the location of said windings with respect to said tubular container.

4,103,814
CHIP BONDING UNIT
Hideya Nishioka, Yokohama, Japan, assignor to Fujitsu Limited, Japan
Filed May 6, 1976, Ser. No. 683,730
Claims priority, application Japan, Oct. 5, 1975, 50-56621
Int. Cl.[2] H01L *21/60*
U.S. Cl. 228—6 A 10 Claims



1. A chip bonding unit including a collet for holding a semiconductor chip having a silhouette, a mounting bed for mounting semiconductor chips, and a working table for holding a base plate to which the chip is to be attached, said collet having variable relative positions with respect to said mounting bed and said working table, respectively; said unit further comprising:

a light source for generating a light beam and for scanning the surface of said chip therewith so as to define a scanning line, and a light receiving element on a side of said chip remote from said light source for receiving said light beam so as to detect, by non-reception of light, the silhouette of said chip;

means for controlling the relative position of said collet and chip in accordance with said detection of said silhouette so that said chip comes to a normal position relative to said collet;

means responsive to said chip being at said normal position for actuating said collet to pick up said chip; and

means for controlling the relative position of said collet and said working table so as to place said chip in a predetermined position relative to said working table, and including means for attaching said chip to said base plate;

said means for controlling the relative position of said collet and said chip including means for rotationally reorienting said chip relative to said collet so that one of the diagonals extending from one corner to the opposite corner of said chip coincides with said scanning line defined by said surface scanning of said light source.

8. In a chip bonding unit for bonding semiconductor chips having a predetermined silhouette, wherein each successive chip to be bonded is opaque to light and is disposed in a pickup area prior to pickup for bonding by a collet also having said predetermined silhouette, each successive chip being further disposed in said pickup area so that the center of each successive chip coincides with the center of said pickup area; an apparatus for rotatably adjusting the orientation of each successive chip in said pickup area, comprising in combination:

a mounting bed rotatable about a fixed vertical axis and having an overlying adjustable sheet for holding said chips to be bonded, said vertical axis defining the center of said pickup area on said sheet;

means for laterally scanning said pickup area with a light beam along at least one predetermined axis thereof;

means for receiving said light beam and responsive thereto for producing an output signal waveform indicating the

positioning of said chip in the light beam path in said pickup area;

control circuit means responsive to said output signal waveform for correlating the orientation of said chip in said pickup area with the orientation of said collet to issue a control signal indicating a rotational difference between the orientation of said chip and the orientation of said collet; and

motor means coupled to said control circuit means and operatively associated with said mounting bed for rotating said mounting bed about said fixed axis to adjust the orientation of said sheet in accordance with said control signal from said control circuit means, whereby to adjustably reduce the rotational difference between the orientation of said chip and the orientation of said pickup area.

4,103,815

GAS PRESSURE WELDING SYSTEM

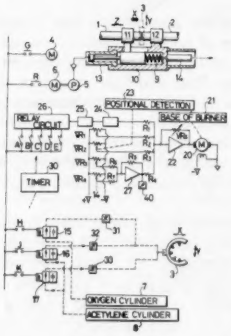
Takao Yokokawa, Tokyo; Shigeo Takano, Machida; Yasuaki Ichinose, Sayama; Toshiyuki Kasahara, Hino, and Fumiaki Ikeda, Nishinomiya, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Division of Ser. No. 674,558, Apr. 7, 1976. This application Feb. 4, 1977, Ser. No. 765,748

Claims priority, application Japan, May 26, 1975, 50-62615; Apr. 7, 1975, 50-42074

Int. Cl.[2] B23K *19/00*

U.S. Cl. 228—9 **9 Claims**



1. An automatic gas pressure welding system comprising:

means for causing the ends of a couple of steel bars to be butted to each other by pressing of said steel bars;

means for heating the vicinity of the butted portion of said steel bars;

means for controlling the action of said pressing means and that of said heating means; said control means comprises the following items:

means for detecting that the amount of contraction of said bars has reached a preset value of δ_2 and thereafter stopping a primary pressing action of said pressing means, provided that a designated time has elasped.

means for starting a secondary pressing stage in the wake of the stop of the pressing by said pressing means;

means for stopping heating by said heating means, when the amount of contraction of said steel bars reaches the preset value of δ_3 while the pressure continues to provide a tertiary pressing action; and

means for stopping the tertiary pressing action of said pressing means, when the amount of contraction of said steel bars reaches the preset value of δ_4.

4,103,816

METHOD AND DEVICE FOR WELDING CYLINDRICAL ELEMENTS TO ONE ANOTHER

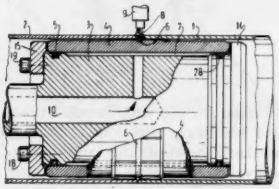
Christiaan Gustaaf Adolf Scholtus, Oudorp; Eduard Lijbrink, Bergen; Franciscus Alexander Theodorus Meijer, Egmond a d Hoef, and Antonius Ruiter, Schagen, all of Netherlands, assignors to Ultra Centrifuge Nederland N.V., The Hague, Netherlands

Filed Oct. 24, 1975, Ser. No. 625,474

Claims priority, application Netherlands, Oct. 25, 1974, 7414020.

Int. Cl.[2] B23K *37/04*

U.S. Cl. 228—49 **7 Claims**



1. A device for welding cylindrical elements which comprises:

an elastic ring being accommodated in a sleeve such that a space exists laterally between said ring and said sleeve;

means for introducing a pressurized medium into said space;

said ring, sleeve and space between said ring and sleeve being specially arranged such that when the pressurized medium is introduced into said space, said ring is displaced laterally so as to engage and align both of the cylindrical elements to be welded by placing radial pressure to said elements near the site of welding; and

said sleeve being thicker adjacent the center of the sleeve than at its ends, the open surface of the sleeve extending from the ends of the sleeve to the thicker section being recessed, said extended recessed sections comprising at least 50 percent of the sleeve length.

4,103,817

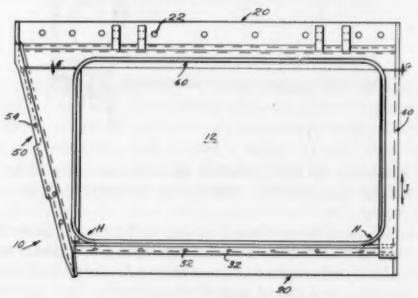
RAILWAY HOPPER CAR DOOR FRAME ASSEMBLY

Thomas G. Spatig, Huntington, W. Va., assignor to The Chesapeake and Ohio Railway Company, Cleveland, Ohio and The Baltimore and Ohio Railroad Company, Baltimore, Md.

Filed Jul. 3, 1975, Ser. No. 592,862

Int. Cl.[2] B23K *31/02, 37/04;* **B61D** *7/18, 7/72*

U.S. Cl. 228—173 C **4 Claims**



1. A method of constructng a railway hopper car door frame assembly having a vertical and a horizontal dimension comprising the steps of

(a) forming opposed top and bottom components, two opposed side components and a door closure surface forming member, of plate steel, individual components of one pair

of opposed components each being of a predetermined length,

(b) placing said top, bottom, and side components in position to be assembled, one of said dimensions of said assembly to be formed being defined by said predetermined lengths of said one pair of opposed components,

(c) adjusting said other dimension of said assembly to be formed by moving adjoining components relative to each other in said other dimension,

(d) welding said components together along two surfaces of engagement therebetween each,

(e) bringing said door closure surface forming member into engagement with receiving surfaces on said top, bottom, and side components,

(f) adjusting said door closure surface forming member with respect to said top, bottom, and side components, and

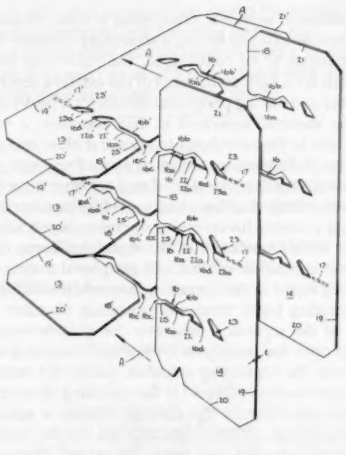
(g) welding said door closure surface forming member to the respective receiving surfaces of said top, bottom and side components.

4,103,818

CARTON DIVIDER

Wallace O. Raubenheimer, R.D. #2, Guinea Hollow Rd., Lebanon, N.J. 08833

Filed Mar. 23, 1977, Ser. No. 780,517
Int. Cl.[2] B65D *5/48*
U.S. Cl. 229—15 **15 Claims**



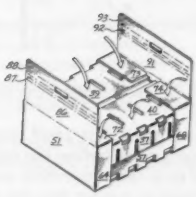
1. A collapsible carton divider having at least one substantially planar partition and one substantially planar cross-partition interlocked therewith along an imaginary line of intersection between their respective planes, each said partition and cross-partition having parallel and opposite first and second edges and partition interlock means for interlocking with each partition which interlocks therewith, each said partition interlock means comprising means defining an open-ended slot having opposite side edges extending inwardly from said first edge thereof and being spaced apart a distance which is substantially greater than the thickness of the partition and a closed-end thereof located intermediate said first and second edges of the partition, a surface portion aligned with said slot and which determines, and extends beyond, said closed end of the latter towards said second edge of the partition, means defining a locking tab projecting from one of said side edges of said slot and providing a first abutment edge facing away from the open end of said slot, and means defining a tab-receiving opening within said surface portion and providing a second abutment edge aligned with said first abutment edge and also facing away from the open end of said slot, said surface portion on each of said interlocked partitions being received in said slot of its interlocked partition and said locking tab on each of said interlocked partitions being received in said tab-receiving opening of its interlocked partition, said interlocked partitions being pivotable in either direction along all of said lines of intersection whereby said divider may be pivoted from an open condition thereof defined by a substantially angular disposition of each said partition with resepct to each said interlocked cross-partition to either of two collapsed conditions thereof depending upon the direction of said pivoting from said open condition, either of said collapsed conditions being defined by a substantially adjacent and parallel disposition of each said partition with respect to each said interlocked cross-partition, said first abutment edges on the respective of said partitions respectively abutting said second abutment edges on the respective of said interlocked partitions when said divider is in either of its said collapsed conditions and in its said open condition, said tab-receiving opening of each said partition further providing a tab-retainer edge aligned with said one side edge of said slot from which said locking tab projects, the distance of projection of said locking tab on each of said partitions being substantially greater than the thickness of the partition whereby said locking tabs overlap the respective of said tab-retainer edges of said tab-receiving openings with which said locking tabs are respectively associated when said divider is collapsed in one direction to a first of said two collapsed conditions thereof, all of said locking tabs in their said overlapping positions then being on the same side of said divider, and whereby disengagement of said interlocked partitions by movement of one with respect to another in either direction along any of said lines of intersection is substantially prevented when said divider is in both its said first collapsed condition and its said open condition.

4,103,819

TWO-PIECE CONTAINER

Herbert D. Muise, Garden Grove, Calif., assignor to Weyerhaeuser Company, Tacoma, Wash.

Continuation of Ser. No. 667,047, Mar. 15, 1976, abandoned.
This application Dec. 13, 1976, Ser. No. 749,850
Int. Cl.[2] B65D *5/28, 5/18*
U.S. Cl. 229—33 **16 Claims**



1. A container comprising:

an inner tray comprising bottom, side and end walls;

an outer tray comprising bottom and end walls contiguous with the bottom and end walls of said inner tray, and side flaps attached to said inner tray side walls;

a cover panel attached to one of said trays; and

cover panel locking means attached to one of said trays.

4,103,820

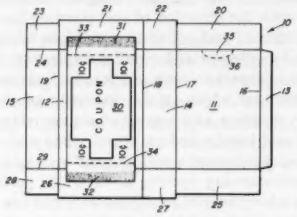
CARTON WITH INSERT

Frederic N. Mathison, and Roger E. Straub, both of Camden, Del., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jan. 9, 1973, Ser. No. 322,235
Int. Cl.[2] B65D *5/10*
U.S. Cl. 229—37 R **16 Claims**

1. In a carton formed of semi-rigid packaging material which carton includes a pair of opposed face panels joined along fold lines to a pair of opposed side panels:

(a) a flap joined along a fold line to one of said panels;
(b) an insert adhered to the interior surface of said flap and having a line of perforations perpendicular to the length of said insert and extending along said fold line joining said flap and adjacent panel;



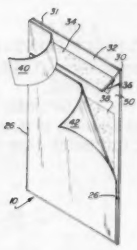
(c) said insert further adhered to the interior surface of said adjacent panel and having a second line of perforations perpendicular to the length of said insert.

4,103,821

SHIPPING ENVELOPE

Peter A. Gartshore, and James O. Ward, both of Portland, Oreg., assignors to Pak-Well Corporation, Denver, Colo.

Filed Jul. 22, 1977, Ser. No. 818,119
Int. Cl.[2] B65D *27/00*
U.S. Cl. 229—74 **5 Claims**



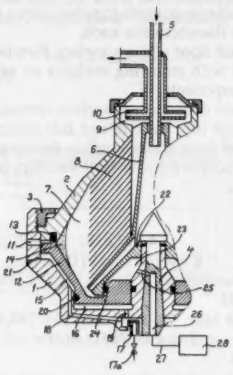
1. A shipping envelope for containing packing sheets and the like, comprising:
a forward panel and a rear panel closed along their side edges and along a first bottom end edge, with their second ends free of each other to provide access to the interior;
each panel having an interior face and an exterior face;
the forward panel being substantially longer than the rear panel;
the excess length of the forward panel constituting a flap foldable over the rear panel and the mouth of the envelope to serve as a closure, a fold line being formed between the flap and the forward panel;
a first area of adhesive on a major part of the exterior face of the rear panel;
a second area of adhesive on at least a portion of the exterior face of the flap;
and release sheets overlying the adhesive areas of the flap and the rear panel;
the release sheet on the rear panel being removable to facilitate attachment of the envelope to a package with the mouth of the envelope open to receive shipping documents;
and the release sheet on the flap being removable to facilitate folding the flap over and under the mouth of the envelope and attachment of the exterior face of the flap to the package.

4,103,822

CENTRIFUGAL SEPARATOR

Klaus H. D. Stroucken, Ronninge, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Jun. 6, 1977, Ser. No. 804,074
Claims priority, application Sweden, Jun. 11, 1976, 7606638
Int. Cl.[2] B04B *11/00*
U.S. Cl. 233—20 A **9 Claims**



1. A centrifugal separator comprising a rotor mounted for rotation about an axis and having a separating chamber with an inlet for material to be centrifuged, the rotor also having a central outlet for a light component of the material separated in said chamber and having peripheral outlets for a heavy component of the material separated in said chamber, a member slidable axially in the rotor body to open and close said peripheral outlets and forming a substantial part of one end wall of the separating chamber, the side of said member turned away from the separating chamber coacting with the rotor to form an operating chamber for receiving operating liquid which, by its pressure during operation of the separator, keeps the slidable member in position to close said peripheral outlets, means for supplying liquid to the operating chamber, means for draining off operating liquid from said operating chamber during operation of the separator, whereby the slidable member is actuated to open the peripheral outlets and thereby discharge material from the separating chamber, means for retaining a predetermined amount of liquid in the operating chamber upon draining thereof, whereby the slidable member is actuated to close the peripheral outlets when only part of the material in the separating chamber has been discharged through said outlets, and means independent of said liquid supplying means and said liquid draining means for adjusting the magnitude of the force by which the sliding member is kept in its position for closing the peripheral outlets, so that upon draining of operating liquid by actuation of said draining means, an accurately predetermined force is maintained acting on the sliding member in the direction toward its position for closing the peripheral outlets.

4,103,823

PARITY CHECKING SCHEME FOR DETECTING WORD LINE FAILURE IN MULTIPLE BYTE ARRAYS

Frederick John Aichelmann, Jr., Hopewell Junction; Nino Mario Di Pilato, Unionvale; Thomas Peter Fehn, Mahopac, and George John Rudy, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

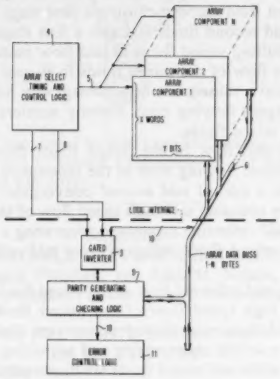
Filed Dec. 20, 1976, Ser. No. 752,336
Int. Cl.[2] G06F *11/00*; G11C *29/00*
U.S. Cl. 235—312 **6 Claims**

1. Word line failure detecting apparatus comprising:

word line means for storing a plurality of bytes of data bit signals and respective parity bit signals,

an equal plurality of parity generating and checking means,

means for directly applying the data bit signals of each stored byte to a respective one of said parity generating and checking means,



means for directly intercoupling the parity bit signals associated with all but one of said stored bytes with respective parity generating and checking means, and

means for inversely intercoupling the parity bit signal associated with said one of said stored bytes with its respective parity generating and checking means.

4,103,824

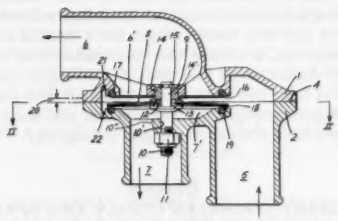
THERMOSTAT FOR COOLANT PRESENTED AS SWITCH SPECIFICALLY FOR COMBUSTION ENGINES

Gerd W. Seifert, P.O. Box Seeberg 29, D-8919 Schondorf, Fed. Rep. of Germany

Filed Jul. 25, 1974, Ser. No. 491,818

Int. Cl.[2] F01P *7/02*

U.S. Cl. 236—34.5 **17 Claims**



1. Thermostat for engine liquid coolant for changing coolant passage from an input chamber to one of a radiator passage and a bypass passage comprising:

a temperature sensitive elastic spring valve member;

a thermal insulating layer on one surface of said valve member;

said valve member being mounted to spring in one direction at a first predetermined coolant temperature to effect a first open passage between said input chamber and said radiator passage; and

said valve member being mounted to spring in a second direction below a second predetermined coolant temperature which is less than said first predetermined coolant temperature to effect a second open passage between said input chamber and said bypass passage to thereby bypass said radiator passage.

4,103,825

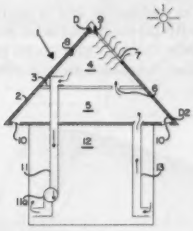
SOLAR HEATED AND COOLED DWELLING

Harold F. Zornig, Pendleton, S.C., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 19, 1977, Ser. No. 798,723

Int. Cl.[2] F27J *3/02*

U.S. Cl. 237—1 A **4 Claims**



1. A solar heated and cooled dwelling comprising:

(a) a ceiling;

(b) one or more rooms below said ceiling;

(c) an attic roof above said ceiling defining an attic enclosed by said roof and ceiling;

(d) a partition in said attic dividing the attic into first and second attic plenums; wherein said first plenum is enclosed by said partition and by part of said attic roof; wherein said second plenum is enclosed by said ceiling, said partition, and by that part of said attic roof not enclosing said first plenum; wherein said partition has an aperture therein to permit air to flow between said first and second plenums, said aperture being disposed in the lower part of said first plenum; wherein a part of said attic roof which partially encloses said first plenum is composed of material that readily transmits solar energy into said first plenum;

(e) solar energy-absorption means disposed within said first plenum to generate hot air therein;

(f) first attic vent means in the upper part of said first plenum;

(g) second attic vent means in said second plenum;

(h) means to close said first vent means;

(i) means to close said second vent means;

(j) first conduit means between said first plenum and said rooms to convey heated air from said first plenum to said rooms;

(k) second conduit means between said rooms and said second plenum to convey air from said rooms to said second plenum;

(l) means to close said first conduit means; and

(m) means to close said second conduit means.

4,103,826

HEAT EXCHANGER FOR A FREESTANDING HEATING UNIT

Richard J. Wass, 376 Gorden Petty Ct., Brentwood, Tenn. 37027

Filed Apr. 4, 1977, Ser. No. 784,582

Int. Cl.[2] F24B *7/04*

U.S. Cl. 237—55 **5 Claims**

1. A heat exchanger for a freestanding heating unit having an exhaust duct, said heat exchanger comprising:

(a) a tubular body having inlet and outlet ports at opposite ends;

(b) a bracket mounted to the outer surface of said tubular body;

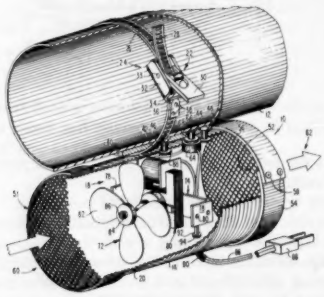
(c) a clamp constrained by said bracket, said clamp configured to captively hold said tubular body to said exhaust duct of said freestanding heating unit, said clamp disposed about an axis that is parallel to a longitudinal axis of said tubular body, a longitudinal axis of said tubular body in

spaced parallel relationship to a longitudinal axis of said exhaust duct when said heat exchanger is mounted to said exhaust duct;

(d) a temperature sensor mounted to said bracket, said temperature sensor having opened and closed states; and

(e) a blower including a motor and a blade assembly, said motor mounted within said tubular body and electrically connected to said temperature sensor, said motor having energized and deenergized states, said blade assembly is connected to said motor and is operative to create an air flow inwardly through said inlet port, about said motor and outwardly through said outlet port;

(f) a power line connected to said temperature sensor and said blower,



(g) said motor in its energized state when said temperature sensor is in its closed state, said motor in its deenergized state when said temperature sensor is in its opened state,

(h) said tubular body includes a plurality of ribs about its periphery, said ribs forming expanded interior and exterior conductive heating surfaces;

(i) a cap mounted to each end of said tubular body, each said cap having a face plate with a plurality of interwoven strips defining an air deflector and a band, the margins of each said face plate wrapped about the margin of said tubular body, said band superposed on the wrapped margins of said face plate, said band mounted to said tubular body and captively holding said face plate to said tubular body.

4,103,827

METHOD OF AND APPARATUS FOR GENERATING MIXED AND ATOMIZED FLUIDS

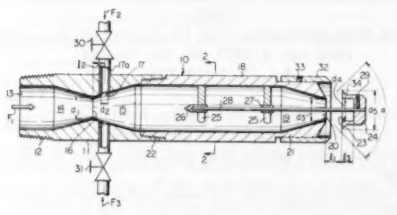
Toshiharu Kumazawa, Fujisawa, Japan, assignor to Mitsubishi Precision Co., Ltd., Kamakura, Japan

Filed Sep. 22, 1976, Ser. No. 725,567

Claims priority, application Japan, May 27, 1976, 51-060558; Jul. 8, 1976, 51-089803[U]

Int. Cl.[2] B05B *7/00*

U.S. Cl. 239—8 **10 Claims**



1. A method of generating a flow of mixed and atomized fluids from at least two fluids selected from gases, liquids and powders, said method comprising the steps of:

directing a flow of a first fluid along a conduit means into a flow passageway having a first convergent flowing zone and a divergent flowing zone fluidly connected to an end of said first convergent flowing zone, thereby generating a low pressure flow of the first fluid in said flow passageway;

separately and concurrently introducing at least two separate flows of a second fluid into the low pressure flow of the first fluid thereby causing a first stage mixing of the first and second fluids and also a first stage atomizing of the resulting mixed fluids in said flow passageway;

guiding a flow of the mixed fluids from said flow passageway into a subsequent flow passageway having a second convergent flowing zone, thereby accelerating said flow of the mixed fluids;

spouting said flow of the mixed fluids from said second convergent flowing zone of the subsequent flow passageway at a side of said second convergent flowing zone, thereby colliding said high speed flow of the mixed fluids with said reflecting means and generating a reflected flow of the mixed fluids reflected from said reflecting means, and;

colliding said reflected flow of the mixed fluids with a subsequent high speed flow of the mixed fluid subsequently spouted from said second convergent flowing zone, to cause a second stage mixing and atomizing of said mixed fluids while said mixed fluids are dispersed toward a space surrounding said reflecting means.

3. A fluid spouting composite nozzle unit, for generating mixed and atomized fluids from at least two fluids selected from gases, liquid and powders, comprising in combination:

first nozzle means for effecting a first stage mixing and atomizing of the fluids;

second nozzle means for spouting the fluids mixed and atomized by said first nozzle means toward a downstream side thereof;

guide conduit means for guiding the fluids mixed and atomized said first nozzle means to said second nozzle means;

fluid reflecting means positioned on the downstream side of said second nozzle means for cooperation therewith to define an outlet space in which fluid from said second nozzle means collides with fluid reflected from said reflecting means, the shape and size of said space being determined by the configurations, dimensions, and spacing of said reflecting means and said second nozzle; and

means for interconnecting said first and second nozzle means, said conduit means, and said fluid reflecting means,

wherein said first nozzle means has a conical convergent passageway, a conical divergent passageway concentrically connected to said conical convergent passageway and at least two fluid supply openings into said conical divergent passageway, and wherein said second nozzle means has a conical convergent passageway.

4,103,828

ROTARY SPRINKLER IMPACT ARM SPRING ADJUSTMENT

H. Curtis Ridgway, Dallas, Tex., assignor to Telsco Industries, Inc., Dallas, Tex.

Filed Jan. 17, 1977, Ser. No. 759,727

Int. Cl.[2] B05B *3/14*

U.S. Cl. 239—206 **17 Claims**

1. Adjustment means for the bias spring on an impact arm of an impact sprinkler having a laterally directed nozzle cooperating with the impact arm which comprises:

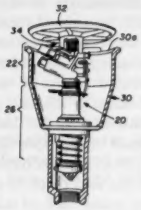
a shaft extending above the nozzle on which the impact arm is journaled;

a cage extending above the nozzle within which the arm is mounted and having a top plate;

a helical bias spring surrounding said shaft secured at the lower end to the impact arm;

a bushing secured to the upper end of said spring and engaging the plate of said cage said bushing being manually adjustable relative to the top plate from above the top

plate for varying the force supplied by said spring to the impact arm; and



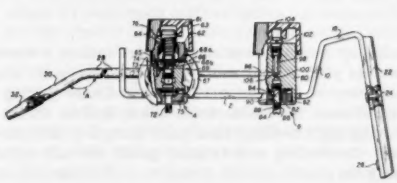
a top cover supported by said cage and having an aperature therethrough to permit adjustment of said bushing from above said top cover.

4,103,829

PORTABLE OXYPROPANE TORCH

Frank A. Zagara, Pittsford, and John M. Nelson, Rochester, both of N.Y., assignors to Bernzomatic Corporation, Rochester, N.Y.

Filed Nov. 10, 1976, Ser. No. 740,470
Int. Cl.[2] F23D *13/04*
U.S. Cl. 239—304 **11 Claims**



1. Portable hand-held oxypropane torch comprising a generally rectangular planar sheet of material forming a carrier member having openings adjacent opposite ends, oxygen valve means and propane valve means supported on the carrier member each in one of said openings each of said valve means including means for attaching a tank of fuel or oxygen, said sheet of material including a bent end portion forming an integral handle connected to the carrier member, a nozzle conduit, means connecting said oxygen valve means for gaseous fluid communication to the nozzle conduit, a propane conduit connected at one end to said propane valve means and connected at the other end thereof in gaseous fluid communication with said nozzle conduit downstream from the point where the oxygen valve means is connected to the nozzle conduit and a nozzle terminating said nozzle conduit.

4,103,830

FLAT SPRAY NOZZLE HEAD FOR A MANUALLY-OPERATED SPRAY GUN

Heinrich Roth, Kreuzlingen, Switzerland, assignor to Theo Krebs AG, Kreuzlingen, Switzerland

Filed Dec. 22, 1976, Ser. No. 753,489
Claims priority, application Switzerland, Jan. 28, 1976, 1029/76
Int. Cl.[2] B05B *1/04*
U.S. Cl. 239—587 **7 Claims**

1. A flat jet spray head for a manually-operated spray gun operating without compressed air for spraying a material, comprising:

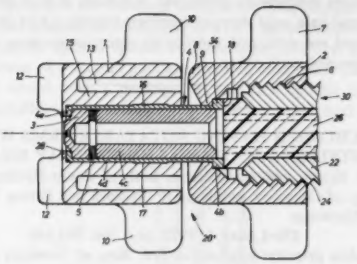
a connection portion adapted to be connected to a spray gun;

a nozzle portion;

a nozzle body arranged in said nozzle portion;

an infeed element arranged in the nozzle portion for the infeed of material to be sprayed to said nozzle body;

said infeed element being of bipartite construction composed of an inner portion and an outer casing portion surrounding said inner portion; said outer casing portion connecting the nozzle portion to the connection portion and having a front end wall engaging with said nozzle body



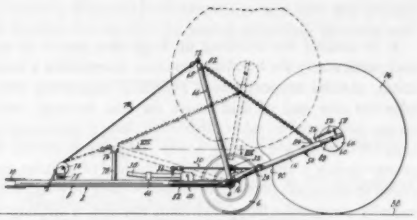
and a rear end wall rotatably mounted in said connection portion, whereby any forces exerted on the nozzle body are transmitted to and taken up by said connection portion.

4,103,831

BALE HANDLING DEVICE

Ronald L. Laudemann, Rte. 1 - Box 39, and Gary L. Kasten, Rte. 1 - Box 98, both of White City, Kans. 66872

Filed May 2, 1977, Ser. No. 792,650
Int. Cl.[2] B60P *1/04*
U.S. Cl. 214—1 HA **4 Claims**



1. A bale handling device comprising:

a. a wheeled vehicle adapted to be moved over the ground,

b. a pair of laterally spaced apart arms carried by said vehicle and extending rearwardly therefrom to bridge the ends of a cylindrical bale resting on the ground, said arms being disposed in a laterally horizontal plane, each of said arms being pivotally connected at its forward end to said vehicle on a transverse axis lying in a vertical plane, whereby to be horizontally pivotable, and for vertical movement about a transverse horizontal axis,

c. a spindle carried by each of said arms at its rearward end, said spindle being generally horizontal and extending transversely of said arm toward the other of said arms, whereby when said arms are pivoted horizontally to a rearwardly divergent relation, said spindles may also bridge the ends of said bale,

d. means operable to pivot said arms horizontally inwardly to a parallel position, whereby said spindles enter said bale axially thereof,

e. means operable to pivot said arms simultaneously upwardly and forwardly toward a vertical position, whereby said spindles elevate said bale above the ground, and

f. a bale support member affixed to each of said arms intermediate its pivotal axis and the spindle carried thereby, the support member of each arm extending toward the other of said arms, and being generally parallel with and laterally spaced apart from the associated spindle by a distance no greater than the radius of said cylindrical bale,

whereby to be engaged by, and to assist said spindle in supporting the weight of, said bale as said arms are pivoted upwardly toward a vertical position, and whereby, as said vehicle is positioned to bridge said arms, while in their rearwardly divergent positions, across the ends of said bale, said support members engage a side of said bale and are deflected thereby to assist in pivoting said arms toward each other.

4,103,832

CRUSHER HAVING ROTATABLE ARMS WITH STRIKER TOOLS AND LIQUID SPRAY MEANS

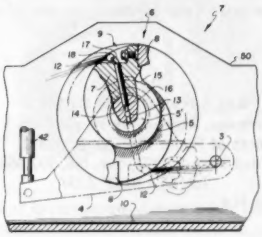
Ernst Braun, and Gert Braun, both of Essen-Heisingen, Fed. Rep. of Germany, assignors to Halbach and Braun, Fed. Rep. of Germany

Filed May 4, 1977, Ser. No. 793,648

Claims priority, application Fed. Rep. of Germany, May 25, 1976, 2623304

Int. Cl.[2] B02C *23/18*

U.S. Cl. 241—38 **7 Claims**



1. A crusher for breaking up large size pieces of material, and particularly for breaking up coal, comprising a housing, a crank, pivotal support means pivotally supporting said crank adjacent one end of said crank on said housing, oscillation means connected to said crank to oscillate it about said pivotal support means, a crushing roller rotatably mounted on said crank having a shaft portion, a plurality of striking arms secured to said shaft portion for rotation therewith and extending radially outwardly from said shaft portion, a striking tool on each of said arms oriented forwardly in a direction of rotation of said arms, a crusher plate in said housing cooperable with said striking tools and spaced from said crushing roller by a distance defining a vertical passage clearance for material to be crushed therebetween, a liquid supply means including a conduit extending through at least one of said striking arms and having a discharge end, a spray nozzle on said discharge end directed in a direction opposite to the rotational direction of said arms so that the liquid is discharged in the shadow area of said striking tools.

4,103,833

YARN WINDING APPARATUS

Katsumi Hasegawa, Kusatsu; Akio Ando, Otsu; Chikayasu Yamazaki, Kyoto; Morio Okada, Nishinomiya; Norihiro Aoi, Okazaki, and Nobuhiko Tanbara, Kyoto, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 21, 1976, Ser. No. 688,921

Claims priority, application Japan, May 29, 1975, 50-64763; May 29, 1975, 50-64766; May 29, 1975, 50-64768

Int. Cl.[2] B65H *54/02, 67/04*

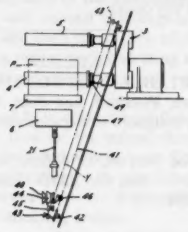
U.S. Cl. 242—18 A **7 Claims**

1. In a yarn winding apparatus for the continuous winding of a single end of yarn including a revolving mechanism carrying a plurality of spindles wherein each spindle is adapted to carry a bobbin, yarn catching means associated with said bobbin for catching yarn for winding thereon, and wherein means are provided for rotating said revolving mechanism so that an end can be shifted from a full bobbin to an empty bobbin, the combination which comprises:

(a) a plurality of intermediate shafts, each shaft installed concentrically with the axis of rotation of fais revolving mechanism, each shaft connected to one of said spindles;

(b) drive means including independent sources of power, each source connected to one of said shafts so that said spindles are individually driven, each of said power sources being positioned at the back of said revolving mechanism, and each of said spindles being positioned at the front of said revolving mechanism, said intermediate shafts extending from said front to said back;

(c) a plurality of dead axles, each of said dead axles attached to the front of said revolving mechanism and supporting one of said spindles; and



(d) shifting means comprising support means, a traverse fulcrum guide means and a travelling yarn guide means positioned on said support for automatically guiding the yarn from a full bobbin to an empty bobbin, means for moving said travelling yarn guide along a predetermined path surrounding said fulcrum guide and said spindles along the exterior of said winder so as to cross the path of yarn extending to the full bobbin, said traverse fulcrum guide consisting of a fixed conical member and a rotating member only so positioned relative to the travelling guide so as to catch at a predetermined point, only the yarn extending from the travelling guide to the full bobbin, whereby when the travelling guide reaches a predetermined position above said revolving mechanism, said mechanism is actuated and rotated to shift from a full to an empty bobbin so that the yarn is picked up by the yarn catching means for winding on the empty bobbin.

4,103,834

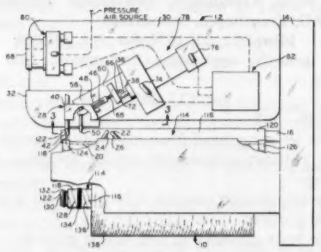
APPARATUS FOR WINDING AN IMPROVED YARN SUPPLY PACKAGE

Jack A. Banning, Rocky Mount, N.C., assignor to Phillips Fibers Corporation, Greenville, S.C.

Filed Jul. 13, 1977, Ser. No. 815,399

Int. Cl.[2] B65H *54/02, 65/00*

U.S. Cl. 242—18 PW **10 Claims**



1. In a continuous delivery yarn winding device of the type which includes chuck means for rotatably supporting at least

one yarn package holder, drive means for rotating a yarn package holder supported by said chuck means, and yarn traversing means for traversing a running yarn during the winding thereof upon a yarn package holder to from a main yarn package, the improvement comprising:

yarn engaging means on a first end portion of a yarn package holder for engaging a running yarn whereby said yarn is wound about said yarn engaging means adjacent the first end portion of said rotating yarn package holder;

yarn tailing means for positioning said running yarn relative to said rotating yarn package holder, said yarn tailing means including:

first tailing pin means for contacting said running yarn and positioning said yarn along said rotating yarn package holder in a first position corresponding to a first position of said first tailing pin means and thereafter guiding said running yarn along said rotating yarn package holder from the first position of said yarn on said yarn package holder; and

second tailing pin means for contacting said running yarn and positioning said yarn along said rotating yarn package holder in a second position corresponding to a first position of said second tailing pin means and thereafter guiding said running yarn along said rotating yarn package holder from the second position on said yarn package holder; and

control means operatively connected to said yarn tailing means for positioning said first tailing pin means in the first position thereof and for positioning said second tailing pin means in the first position thereof in response to a first signal applied to said control means whereby said running yarn is aligned with the first position on said yarn package holder to form a first waste bunch of yarn thereon, for automatically moving said first tailing pin means out of contact with said running yarn in response to a second signal applied to said yarn tailing means whereby said running yarn is positioned in contact with said second tailing pin means and is aligned with the second position on said yarn package holder for a predetermined time period whereby said running yarn is positioned to form a second waste bunch of yarn on said rotating yarn package holder a distance from said first waste bunch of yarn, and for automatically moving said second tailing pin means from the first position thereof to a second position thereof after said predetermined time period whereby said running yarn forms a transfer tail on said rotating yarn package holder during said movement of said second tailing pin means to the second position thereof, whereby the running yarn is so positioned as to be engaged by said traversing means for traversing the running yarn along said yarn package holder to form main yarn package and said second tailing pin means is disengaged from said running yarn.

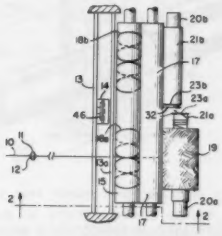
4,103,835
STRAND WINDING APPARATUS

Ralph W. List, East Lansdowne, Pa., assignor to Techniservice Division, Textured Yarn Co., Inc., Kennett Square, Pa.

Filed Aug. 31, 1976, Ser. No. 719,277
Int. Cl.[2] B65H *54/02, 67/04*
U.S. Cl. 242—18 A **5 Claims**

1. In an apparatus for delaying the transfer of a textile strand from a first package for winding said strand onto a second package spaced endwise therefrom, said apparatus including a delay means having passive and active delay positions and comprising a generally T-shaped device having a base leg and an upper cross bar, said base leg being for limited tilting movement from side to side, said active position tilted to engage said strand from said first package and allowing movement along said upper cross bar causing tilting by said strand thereof to a delay position and allowing strand to transfer onto second package, and said passive position not engaging said strand and comprising means including a recocking surface arranged at an angle to contact said strand and to recock said delay device from said passive to said active delay position under the influence of said strand, said tilting to said delay position causing delay of said strand during the strand transfer operation.

5. An apparatus for winding a textile strand, comprising a first circular spindle for formation of a first package thereon, a second circular spindle spaced endwise from said first spindle for formation of a second package therein, means for transferring said strand from a package on said first spindle to said second spindle, strand transfer delay means positioned to be

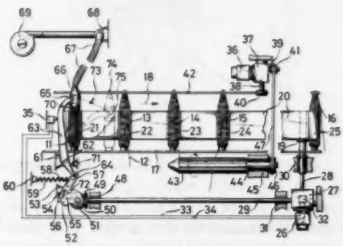


contacted by the transferring strand to delay the transfer of the strand, a first and second circular brush coaxially disposed to said first and second spindles respectively, said circular brushes each capable of catching the strand at a point along the length of the strand whereby said strand is formed into a transfer tail on the respective spindle and is subsequently formed into said respective package, and first and second circular strand cutting means coaxially disposed with respect to said first and second circular brushes for cutting the strand extending between said spindles.

4,103,836
UNDOING OR REMOVING THE THREAD ENDS OF TEXTILE BOBBINS

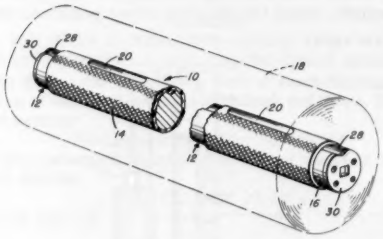
Willi Küpper, Rickelrath, Germany, assignor to W. Schlafhorst & Co., MönchenGladbach, Germany

Filed Jun. 25, 1976, Ser. No. 699,843
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1975, 2528281
Int. Cl.[2] B65H *54/22, 67/08*
U.S. Cl. 242—35.6 E **8 Claims**



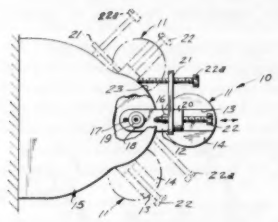
1. In apparatus for undoing or removing thread ends of individually transported textile bobbins which are rotated about their longitudinal axis during transport thereof in a given direction generally transverse to the longitudinal axis of the bobbins and which are blasted with compressed air during the transport from at least one blasting nozzle, the improvement comprising nozzle control means for moving the blasting nozzle axially of the textile bobbins to obtain controlled intensity of the air blast on the surface of the textile bobbin for a controlled period of time.

4,103,837
LOOM CORE
Anthony J. Peters, Columbia, S.C., assignor to Sonoco Products Company, Hartsville, S.C.
Filed Jul. 11, 1977, Ser. No. 814,687
Int. Cl.[2] B65H *75/30, 75/10*
U.S. Cl. 242—46.21 8 Claims



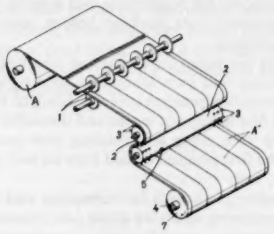
1. A textile fabric take-up spindle for a weaving machine and an associated core, said spindle having a cylindrical exterior with a single full length longitudinal groove formed therein, said core being of an elongated hollow configuration defined by a cylindrical wall with opposed open ends, said core being slidably receivable on said spindle, said cylindrical wall being interrupted solely by a plurality of longitudinally elongated and aligned depressions formed in the exterior thereof, said depressions defining a plurality of internal protrusions closely conforming to and receivable within the single spindle groove for a keying of the core to the spindle to preclude relative rotational movement therebetween.

4,103,838
ADJUSTABLE TOILET PAPER HOLDER
Ernest V. Young, 3 Park View La., Bradford, Mass. 01830
Filed Feb. 7, 1977, Ser. No. 766,086
Int. Cl.[2] A47K *10/24*
U.S. Cl. 242—55.2 4 Claims



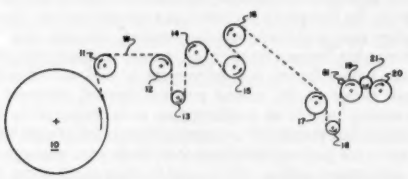
1. An adjustable toilet paper holder comprising an elongated cylinder for removably receiving a roll of paper thereon, a transverse slot on one end of said elongated cylinder, an opening within said transverse slot, a rigid arm slidably received within said transverse slot and having a plurality of openings therein, a first screw fastener received in one of said plurality of openings in said rigid arm and said opening within said transverse slot to secure said rigid arm to said elongated cylinder, a first cylindrical projection, a second screw fastener received in a second of said plurality of openings in said rigid arm to secure said first cylindrical projection to said rigid arm, a hinged arm on the other end of said elongated cylinder, a second cylindrical projection, and means attaching said second cylindrical projection to said hinged arm whereby the holder can be supported by said projections within opposed openings of a mounting bracket.

4,103,839
APPARATUS FOR WINDING CUT BELT-LIKE MATERIAL
Tadayoshi Arimatsu, No. 470, Ibatahama-cho, Turumi-ku, Osaka-shi, Osaka-fu, Japan
Filed Apr. 12, 1977, Ser. No. 786,861
Int. Cl.[2] B65H *35/02*
U.S. Cl. 242—56.2 2 Claims



1. In a cut beltlike material winding apparatus having a take-up winding spindle, a multiplicity of parallel cutters for cutting beltlike material with a longitudinal travel zone therebetween, and, a beltlike material travel adjusting mechanism provided in said travel zone intermediate to said cutters and take-up winding spindle, the improvement therein comprising of said travel adjusting mechanism including rolling conveyor means with projections so disposed thereon as to be brought into contact with the cut beltlike material at right angles to the longitudinal travel zone.

4,103,840
STRETCHABLE MATERIAL REWINDING MACHINE
Daniel J. Dowd, Williamsport, Pa., assignor to Westvaco Corporation, New York, N.Y.
Filed Dec. 14, 1976, Ser. No. 750,469
Int. Cl.[2] B65H *25/22*
U.S. Cl. 242—67.3 R 4 Claims



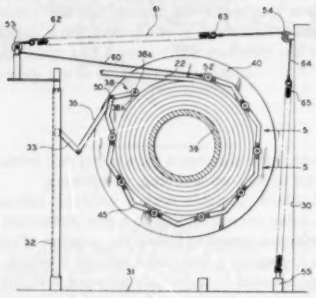
1. A stretchable web material rewind machine comprising a plurality of web guide rolls along a web route between a material supply reel and a rewind reel, said plurality of guide rolls including a pair of S-wrap rolls, said supply reel being driven with an independent drive roll by means of a surface drive belt coursed about said drive roll and bearing against said web material on said supply reel, said independent drive roll and said S-wrap rolls being sheave belt driven, a rotational power source, first and second variable pitch diameter sheave belt drives connecting said power source with said independent drive roll and said S-wrap rolls, respectively, first dancer roll means predominantly supported by said web at a first set position in said web route between said supply reel and said S-wrap rolls and second dancer roll means predominantly supported by said web at a second set position in said web route between said S-wrap rolls and said rewind reel, first dancer roll position sensing means for increasing the variable pitch diameter of said first variable pitch sheave in proportional response to displacements of said first dancer roll in one direction from said first set position and decreasing said first sheave pitch diameter in proportional response to displacements of said first dancer roll

in the other direction from said first set position; and, second dancer roll position sensing means for increasing the variable pitch diameter of said second variable pitch sheave in proportional response to displacements of said second dancer roll in one direction from said second set position and decreasing said second sheave pitch diameter in proportional response to displacements of said second dancer roll in the other direction from said second set position.

4,103,841
HOSE REEL APPARATUS

Thomas P. Flynn, and James C. Wurster, both of Milwaukee, Wis., assignors to Super Products Corporation, Milwaukee, Wis.

Filed Aug. 26, 1977, Ser. No. 827,877
Int. Cl.[2] B65H *75/42*
U.S. Cl. 242—86.2 **9 Claims**



1. A reel system for storing, supplying and winding elongate materials comprising:

a reel mounted upon a support for being rotated for winding or unwinding said elongate material, said reel including parallel side walls and a cylindrical core extending perpendicularly therebetween;

supports means adjacent said reel;

an elongate link assembly, a first end of said link assembly being pivotally mounted to said support means, said link assembly including rollers each having an axis parallel to the axis of said reel and said assembly encircling at least a substantial amount of the circumference of the windings of elongate material provided on said reel; and

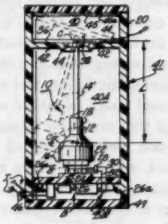
means for maintaining tension on said link assembly whereby contact is maintained by said rollers on said windings regardless of the circumference of windings upon said reel.

4,103,842
LOCKING SENSOR FOR BELT RETRACTOR

Thomas F. Martin, Euclid; James A. Nagy, and Harold R. Scibbe, both of Chardon, all of Ohio, assignors to Repa Feinstanzwerk GmbH, Industriegebiet, Germany

Filed Jul. 7, 1975, Ser. No. 593,276
Int. Cl.[2] A62B *35/02;* **B65H** *75/48*
U.S. Cl. 242—107.4 A **24 Claims**

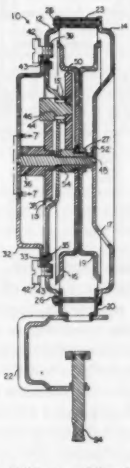
10. In a vehicle having an occupant restraint system having means for restraining forward movement of an occupant in response to an emergency condition including a retractor connected with the restraint system, an emergency locking system including means for actuating the retractor to place the restraint system in a condition in which it restrains forward movement of the occupant, lock control means actuable to lock the retractor, an electrical circuit including mechanically static signal means including means for generating an electric output signal which changes in magnitude in response to changes in the magnitude of an energy field imposed on said mechanically static signal means, an energy field source for imposing an energy field on said mechanically static signal means, circuit means for causing said output signal of said signal means to actuate said lock control means to actuate said retractor at a predetermined magnitude of said output signal, and means for changing the magnitude of the energy field on said mechanically static signal means comprising a pendulum having a pendulum weight mounted for multidirectional displacement from a rest position in response to gravitational-inertial forces due to predetermined modes of the vehicle during an emergency condition, said energy field source being fixedly connected with said pendulum weight and being movable therewith in response to gravitational-inertial forces to change the strength of the energy field on said mechanically static signal means.



4,103,843
FISHING REEL

Carl Nothdurft, 22,412 LaVon, St Clair Shores, Mich. 48081

Filed Mar. 29, 1976, Ser. No. 671,570
Int. Cl.[2] B65H *75/48;* **A01K** *89/017*
U.S. Cl. 242—107 **1 Claim**



1. Improvement in a fishing reel having a spool upon which a fishing line is wound, cover means for said spool, a coil spring for automatically winding up the fishing line upon release thereof, a spring cover for winding up the spring, a gear train for rotating the spool upon unwinding of the spring, said improvement comprising said cover means including two spool covers held together with a first set of fasteners disposed radially outwardly of said spool, said spring cover carried on one of said spool covers, an axle extending between said spring cover and the other of said spool covers, said gear train including a compound gear and a driver gear and a pinion gear, said driver gear and said pinion gear rotatably supported on said axle, said driver gear including a hub made fast therewith, a

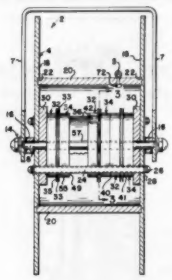
second set of fasteners carried on said one spool cover for fastening the spring cover thereon, bosses formed in said one spool cover for threadably carrying said second set of fasteners, tongue and groove means between the spring cover and said one spool cover disposed inwardly of said second set of fasteners, said spring cover, when loosened during winding of the spring, being held in place and located by the second set of fasteners, by said tongue and groove means, and by said axle, the axle having an end disposed in said spring cover serving as a rotation axis for the latter during winding up of said spring, the inner end of said spring held in a slot in said driver gear hub, means for fastening the fishing line to said spool consisting of an aperture in said spool, a larger aperture in said other spool cover so that the inner end of said fishing line can be threaded through said reel and knotted to hold it against the outside of said spool, and a line guide means for guiding the movement of the fishing line, said line guide means comprising a line guide member and a tubular spacer carried on one of the fasteners of said first set of fasteners, said line guide means serving as a closed loop line guide opening for said fishing line immediately adjacent the spool.

4,103,844

REEL

J. Clifford Deinert, Waverly; Charles E. Taylor, Summit, and Harry W. Mumford, Waverly, all of Pa., assignors to Sandvik, Inc., Scranton, Pa.

Filed Apr. 14, 1977, Ser. No. 787,371
Int. Cl.[2] B65H *75/48*
U.S. Cl. 242—107 **9 Claims**



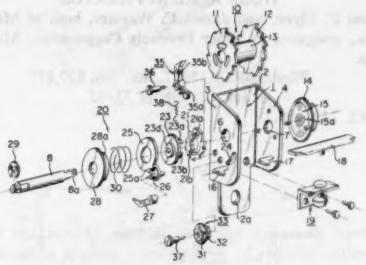
1. A reel construction comprising, the combination of, mounting means comprising a pair of fixed side members which are spaced from each other, fixed axis means mounted respectively in said side members, a reel spool rotatably mounted on said axis means and having side discs adjacent said side members and a cylinder positioned between said side discs and presenting a surface having the same axis as said axis means and forming with said discs a space within which a rope or the like can be wound, a pair of bearing plates positioned respectively adjacent said discs within said cylinder, a plurality of bolts extending through said reel parallel to said axis and positioned less than the radius of said cylinder therefrom, whereby said discs are clamped against said cylinder by said bolts, and a plurality of coil spring assemblies having axes concentric with said axis, each of said spring assemblies comprising a coil spring and a cylindrical casing surrounding the spring, each of said springs having an inner anchor adjacent said axis means and forming a releasable operating connection therewith and having its outer end fixed to its casing, said operating relationship being formed by a notch in said axis means providing a surface which extends radially from said axis and said inner anchor of said surface having an end anchor portion engaging said surface.

4,103,845

TAKE-UP FORCE ELIMINATOR FOR SAFETY BELT RETRACTOR

Takeo Ueda, Fujisawa, Japan, assignor to NSK-Warner K.K., Tokyo, Japan

Filed Jul. 18, 1977, Ser. No. 816,492
Claims priority, application Japan, Aug. 18, 1976, 51-109649[U]
Int. Cl.[2] A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.7 **7 Claims**



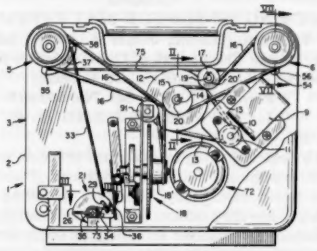
1. A take-up force eliminator for a safety belt retractor using a spring force to take up webbing, comprising:
- a ratchet wheel rotatable with a webbing take-up spindle after a delay corresponding to a predetermined angle;
- rotating means adapted to follow the rotation of said take-up spindle to assume a first and a second position;
- cam means adapted to stepwisely advance with the displacement of said rotating means from said first position to said second position and to assume a first and a second operative position in accordance with the stepwisely advanced positions; and
- locking means adapted to follow said cam means to engage said ratchet wheel when said cam means is in said first operative position, thereby locking said take-up spindle against rotation in the take-up direction, and to be disengaged from said ratchet wheel when said cam means is in said second operative position.

4,103,846

FILM WEB HANDLING MECHANISM

Donald I. Loofbourow, Canby, and Robert E. Lach, Beavertown, both of Oreg., assignors to GAF Corporation, New York, N.Y.

Filed Mar. 23, 1977, Ser. No. 780,647
Int. Cl.[2] G03B *1/04*; G11B *15/32*
U.S. Cl. 242—205 **5 Claims**



1. An improved film web handling mechanism having a housing, a supply spindle and a take-up spindle rotatably mounted on said housing for transporting a film web therebetween, means for rotatably driving said spindles comprising a motor carried on said housing, an endless belt driven by said motor for movement in one direction only not withstanding

the direction of movement of the supply second takeup spindles for imparting a rotational and directional drive force to said spindles, a rotatably mounted supply drive assembly and a rotatably mounted take-up drive assembly, each comprised of a pulley, a clutch means and a rotational drive control means, connected with said spindles for transmitting drive force from the endless belt to the spindles respectively, each of said supply and take-up drive assemblies being rotatably movable between at least a first operating position and a second operating position, each of said supply and take-up drive assemblies being operatively connected by said endless belt to a film web advancing mechanism for advancing said film web, a mode selector assembly mounted for rotation between at least a first and a second operating position connected with said supply drive assembly and said take-up drive assembly for selecting a mode of operating position on the respective supply drive and take-up drive assemblies so that the film web is driven in one mode of operation when said mode selector assembly, said supply drive assembly and said take-up drive assembly are in said first position and in a different mode of operation when said mode selector assembly, said supply drive assembly and said take-up drive assembly are in said second position.

4,103,847

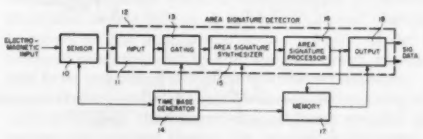
LINE SCAN AREA SIGNATURE DETECTION METHOD

Frank J. Thomas, and Max W. Farrow, both of Orlando, Fla., assignors to Martin Marietta Corporation, Orlando, Fla.

Division of Ser. No. 437,406, Jan. 28, 1974, Pat. No. 3,974,328, which is a continuation-in-part of Ser. No. 165,597, Jul. 23, 1971, abandoned. This application Feb. 9, 1976, Ser. No. 656,683

Int. Cl.[2] F42B *15/02;* **F41G** *9/00, 7/00;* **F42B** *15/10*

U.S. Cl. 244—3.18 **14 Claims**



1. A method of modifying the flight path of a missile comprising the steps of:

(a) scanning a field of view from the missile with a line scan sensor to produce a line scan signal representing sensed variations in scene content along each scan line of the field of view;

(b) generating, in response to the line scan signal, a first electronic signature characterizing area variations within selected segments of a field of view from the missile;

(c) generating, in response to the line scan signal, a second electronic signature characterizing area variations within corresponding selected segments of the field of view from the missile, the second electronic signature characterizing area variations in the field of view at a time subsequent to the variations characterizing by the first electronic signature;

(d) correlating the first electronic signature with the second electronic signature to generate a control signal related to the degree of correlation between the area variations within the selected segments of the first electronic signature and the area variations with the corresponding segments of the second electronic signature; and

(e) controlling the flight path of the missile in response to the control signal.

4,103,848

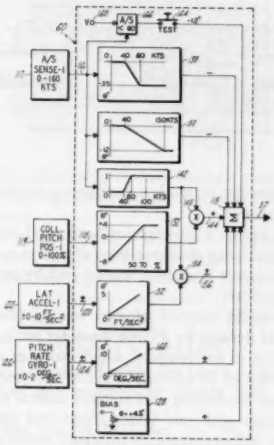
VARIABLE INCIDENCE HELICOPTER STABILATOR AND FAIL SAFE ACTUATOR

Raymond G. Johnson, Jr., Milford; Lou S. Cotton, Monroe, both of Conn., and David J. Verzella, North Palm Beach, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 8, 1977, Ser. No. 775,670

Int. Cl.[2] B64C *11/44*

U.S. Cl. 244—17.13 **15 Claims**



1. A helicopter, comprising:

a fuselage;

a main rotor disposed for rotation with respect to said fuselage in a first plane oriented to provide vertical lift to said fuselage;

airspeed sensing means for providing a signal indicative of the airspeed of said fuselage;

lateral accelerometer means for providing a signal indicative of lateral accelerations of said fuselage;

a stabilator pivotably disposed about a transverse axis substantially parallel to said first plane at the tail of said fuselage;

positioning means disposed between said stabilator and said fuselage and adapted to rotate said stabilator about its axis for various angles of incidence with respect to said fuselage, said positioning means including an electromechanical actuator and an electrical servo loop for driving said actuator to a desired position in response to a position command signal applied thereto;

a tail rotor adapted to rotate in a second plane, substantially parallel to the longitudinal axis of said fuselage and at a small angle with respect to the vertical axis of said fuselage, oriented to provide a thrust component, parallel to said first plane, to the tail of said fuselage in a direction to stabilize said fuselage against the counter-rotative forces resulting from the rotation of said main rotor, and oriented to provide a vertical lift thrust component to the tail of said fuselage;

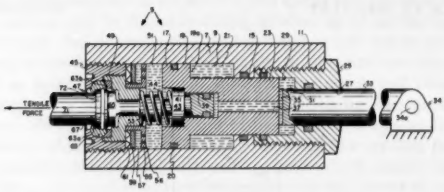
and position command signal generating means, connected for response to said airspeed sensing means and to said lateral accelerometer means, for generating a combined command signal, including signal components for causing said positioning means to position said stabilator at substantially zero average angle of incidence at high speeds and at a maximum angle of incidence at low speeds and to position said stabilator to increased or decreased angles of incidence as a result of lateral accelerations of said fuselage in a direction the same as or opposite to, respectively, the direction of thrust component parallel to said first plane provided to the tail of said fuselage by said tail rotor.

4,103,849

CATAPULT RESTRAINT/RELEASE SYSTEM

Lloyd J. Holt, and Clayton E. Panlaqui, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 15, 1977, Ser. No. 833,415
Int. Cl.[2] B64F *1/04, 1/16*
U.S. Cl. 244—63 **6 Claims**



1. Apparatus for releasably restraining an aircraft prior to launch comprising:

a housing having a concentrically stepped central bore defined by a large diameter bore at a first end joined to a small diameter bore at a second end by an intermediate diameter bore;

a concentrically stepped plunger having first and second ends, and defined by a large diameter section at said first end joined to an elongated small diameter section at said second end by an intermediate diameter section;

said plunger occupying said stepped central bore in sealing relationship with said housing and said elongated small diameter section extending from said housing through said small diameter bore;

said second end of said plunger having means for attachment to a stationary object;

said housing and plunger defining an annular compression chamber and an annular displacement chamber;

said plunger defining a bore communicating with said annular displacement chamber and extending to said plunger first end;

a compressible liquid filling said annular compression and displacement chambers and partially filling said plunger bore;

a piston sealingly engaging said plunger bore and being motion responsive to displacement of liquid from said annular displacement chamber;

a mechanism operative to releasably grip structure attached to an aircraft, said mechanism being attached to said first end of said housing, and said mechanism being operative to release said grip in response to movement of said piston; and

means for dissipating energy from fluid in said compression chamber in response to said mechanism releasing said grip.

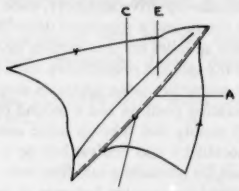
4,103,850

MANEUVERABLE GLIDER KITE

Helen Bushell, 10 Elm Grove, North Kew, Victoria 3102, Australia

Filed Apr. 1, 1976, Ser. No. 664,455
Claims priority, application Australia, Apr. 9, 1975, 83667/75
Int. Cl.[2] B64C *31/06*
U.S. Cl. 244—153 R **1 Claim**

1. A kite, comprising a pair of substantially triangular panels made of pliable material joined along the base edges to form two sails, and joined again along a central joining line spaced from and curved with respect to said base line, and enclosing a portion of the sail area to form a keel, the longitudinal upper edge of the keel formed by said central joining line and the wings thereat having a smooth aerodynamic curve in the longitudinal vertical plane, the bottom edge of the keel and the leading edges of the wings being stiffened by a mast and two



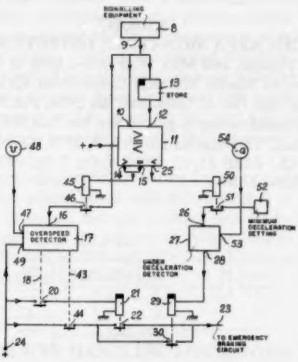
spars respectively, the wings being held in a spread position by a cross-stay non-rigidly connected to each spar member.

4,103,851

CONTINUOUS SPEED CHECKING PROCESS FOR A POWERED VEHICLE AND APPARATUS FOR CARRYING THE PROCESS INTO EFFECT

Jean P. Salmon, Sevran, France, assignor to Jeumont-Schneider, Puteaux, France

Filed Dec. 22, 1976, Ser. No. 753,616
Claims priority, application France, Dec. 24, 1975, 75 39693
Int. Cl.[2] B61L *3/16*
U.S. Cl. 246—63 C **5 Claims**



1. A continuous speed checking process for a powered vehicle under automatic or manual supervision, traveling along a track divided into consecutive block sections, comprising the steps of:

(a) transmitting to the vehicle, immediately upon entering any block section, an exit speed, defined as a speed limit with which the vehicle must comply upon exiting from such section;

(b) storing said exit speed in the vehicle's driving cab;

(c) comparing said exit speed with a stored exit speed for the previous block section;

(d) continuously measuring the vehicle's actual speed and actual deceleration; and

(e) initiating emergency braking under two conditions:

(i) when said exit speed of the block section upon which said vehicle travels equals or exceeds the stored exit speed for the previous block section, and when the vehicle's actual speed exceeds an exit speed of the block section upon which the vehicle travels, said emergency braking is initiated after a predetermined delay;

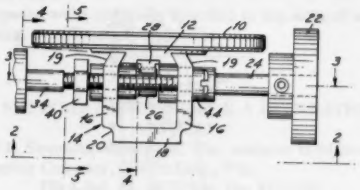
(ii) when said exit speed is less than an exit speed of the previous block section, and the vehicle's actual deceleration is less than a predetermined acceleration, emergency braking is initiated after a predetermined delay.

4,103,852

ADJUSTABLE INSTRUMENT MOUNTING BRACKET

James C. Fisk, G-3219 E. Bristol, Burton, Mich. 48529

Filed Jul. 12, 1976, Ser. No. 704,231
Int. Cl.[2] F16M *11/04*
U.S. Cl. 248—178 **2 Claims**



1. An adjustable instrument mounting bracket comprising, in combination:

a relatively rigid one-piece frame member of general channel-shaped formation formed from a flat strip metal stock cold worked into the channel-shaped formation, said frame member having a common edge of each of its opposing side wall sections integrally joined to the opposite side margins of its bottom section, said opposing side walls having their respective free ends similarly slanting inwardly toward one another and V-shaped to form parallel tracks of a dovetailed guideway in the space between the free ends of the opposing side walls of the frame member;

an instrument mounting part having the underside thereof shaped with V-shaped recesses the walls of which complementarily slidably receive and engage the V-shaped tracks of the dovetailed guideway formed by the channel-shaped frame member;

at least one of said two opposing sidewall sections of the channel-shaped frame member being elastically distortable out of its normal plane and toward the other side wall to decrease the width of the dovetailed guideway with the result that when the width of the dovetailed guideway is decreased in this manner it imposes sufficient clamping pressures on the dovetailed-shaped underside of the instrument mounting part to hold the instrument mounting part from movement along the dovetailed guideway;

means extending across the space between the opposing side wall sections of the channel-shaped frame member and operatively coupled thereto for elastically distorting at least one of said side wall sections out of its normal plane and toward the other side wall to vary the clamping pressure exerted by the side wall sections upon the dovetailed underside of the instrument mounting part; and

the resistance of either one or both of the elastically distortable side wall sections toward the opposing side wall section being lessened by reducing the thickness of the corner formed between the bottom section and at least one of said side wall sections of the channel-shaped frame member thereby to provide a hinge axis along each such corner about which each such side wall section is elastically deflectable toward the other.

4,103,853

ALUMINUM CLUSTER MOUNT

Edward C. Bannan, Vicksburg, Miss., assignor to McGraw-Edison Company, Elgin, Ill.

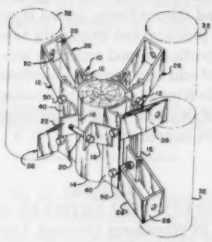
Filed Dec. 22, 1976, Ser. No. 753,605
Int. Cl.[2] E04G *3/00*
U.S. Cl. 248—219.1 **11 Claims**

1. A mount for supporting electrical apparatus on an associated pole comprising:

bearing plate means of generally U-shape with a transverse wall adapted to bear against said pole and having outwardly extending substantially parallel wall portions;

slot means in said wall portions of said bearing plate means;

connecting link means having a hook member on the end thereof for engagement into said slot means and attaching said bearing plate means around said pole; and



bracket means fastenable to said bearing plate means and having mounting means for fastening said electrical apparatus thereto;

said bracket means having a portion overlapping said slot means to lock said hook member therein upon being fastened to said bearing plate means.

4,103,854

SUPPORT FASTENER

Frank V. Pliml, Arlington Heights, and Lloyd A. Erickson, Park Ridge, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Apr. 19, 1977, Ser. No. 788,727
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—235 **2 Claims**

1. A one-piece plastic fastener in combination with a non-circular aperture in a panel, said fastener including a base adapted to cover said aperture and having rear surface means defining a reference for engaging the panel and support means on the opposite surface of said base adapted to engage secondary means, an integral substantially rigid curved hook-like stud which extends outwardly from a root portion adjacent the rear surface of said base and thence reversely bends toward said reference with the free end of said hook-like stud extending beyond an edge margin of said base and terminating in spaced relation to said reference a predetermined distance so that said base rear surface means contacts one surface of said panel while said free end will contact the opposite surface of said panel, said root of said stud having a cross-sectional configuration which at least at a plurality of points is complementary to said aperture and provides shoulder means adjacent to said base which in installed position engages in loadbearing relationship walls of the panel forming said aperture so as to substantially prevent any motion of said fastener in the plane of said panel, and resilient nonload-bearing retaining means carried by said stud and cooperating with said aperture to lock said fastener in non-removeable installed relation with said panel, the aperture in said panel including an enlarged upper portion for accepting said rigid shoulder means of said hook-like stud in complementary loadbearing relation and a communicating slot of smaller size having side and bottom end edges

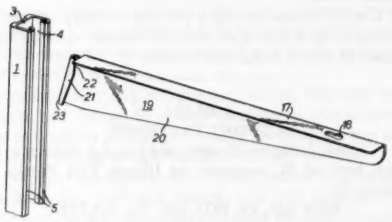
for accepting said retaining means in overlying relation to two adjacent edges thereof, said hook-like stud including a convex exterior surface facing away from said base and a concave recess facing said reference, said retaining means being a resilient arm connected at one end to said convex surface intermediate its length and extending initially generally parallel to said hook-like stud and thence being canted laterally to its free end from said initial position and extending toward said base, the canted free end portion of said retaining arm including a recess along one edge of said arm facing said reference which accepts and overlies a side edge of said slot means and with the free end of said arm overlying said bottom end edge to thereby make said retaining arm nonremoveable.

4,103,855

SUPPORT SYSTEMS FOR ARTICLES OF FURNITURE

Maurice Grosse, 25 Woodberry Crescent, London N10., England

Filed Jul. 1, 1976, Ser. No. 701,529
Int. Cl.[2] A47G *29/02*
U.S. Cl. 248—246 **6 Claims**



1. A support system for articles of furniture which system comprises at least one upright shaped to define along substantially the whole of its length a recess which includes a rear wall having a forwardly facing substantially planar and rigid surface throughout substantially the whole of its width and side walls which open onto the front of the upright, the opening of the recess being flanked at at least one edge by a re-entrant lip turned by substantially 180°, and which system also comprises at least one bracket comprising a single limb constructed and arranged for entry in said recess, the bracket limb comprising a turned back upright engaging portion which is turned back by substantially 180° and which includes an upper rim that hooks behind said re-entrant lip and has a free edge which, in use, extends substantially vertically and engages the concave surface of the lip, and a flat formed on a lower region of said turned back upright engaging portion that abuts against the said forwardly facing substantially planar and rigid surface of the rear wall of the recess at points defining a finite transversely and vertically extending area, said bracket also comprising a support portion which projects forwardly from the upright when the bracket is operatively connected to the upright.

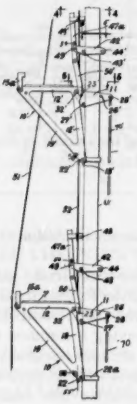
4,103,856

ADJUSTABLE SCAFFOLD BRACKET

Henry Riblet, 87 Crescent Rd., Needham, Mass. 02194

Continuation-in-part of Ser. No. 514,583, Oct. 15, 1974, Pat. No. 3,970,277. This application Jul. 19, 1976, Ser. No. 706,376
Int. Cl.[2] A47B *47/00*
U.S. Cl. 248—246 **28 Claims**

1. In combination,
a scaffold bracket,
an upright member,
said scaffold bracket comprising,
a platform support,
a lock means,
said platform support being attached to said lock means,
said lock means supporting said platform support on said upright,
mechanical jack means, including a jack lock, connected to said scaffold bracket for raising said bracket,
flexible hoist means connected to said scaffold bracket for raising said scaffold bracket and elongated lock disabling means attached to said lock means,



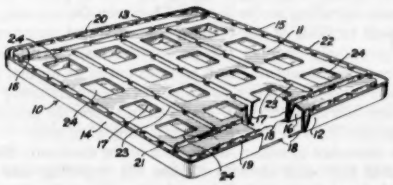
said elongated actuating member being accessible to a person below said scaffold bracket whereby a tensile force on said elongated actuating member will release said lock means from said upright member allowing said scaffold bracket to be lowered by said flexible hoist means.

4,103,857

REINFORCED FIBERGLASS PALLET

Alvin W. Levenhagen, Linesville, Pa., assignor to Molded Fiber Glass Tray Company, Linesville, Pa.

Continuation of Ser. No. 659,467, Feb. 19, 1976, abandoned. This application May 6, 1977, Ser. No. 794,665
Int. Cl.[2] B65D *19/24*
U.S. Cl. 248—346 **2 Claims**



1. A rectangular pallet made of a composite thermo-setting resin reinforced with glass fiber and steel bars comprising,
a rectangular platform having sides and ends made generally of a flat, plate-like member having a generally flat top surface made of thermo-setting resin reinforced with glass fiber,
two downwardly extending, spaced marginal first ribs integrally attached to said platform adjacent its sides and two spaced downwardly extending marginal second ribs integrally attached to said platform adjacent its said ends,
spaced third ribs extending parallel to said second ribs and attached to said first ribs,
each said first rib being integrally attached to a said second rib at a corner of said platform,
a grid made of steel rods providing tensile members comprising longitudinally extending first rods and laterally extending second rods and laterally extending third rods,
and said ribs being V-shaped in cross-section having plate-

like sides integrally attached to said platform at their upper ends and converging downwardly and toward each other and being integrally connected together at their lower end at an externally rounded apex portion substantially thicker than said plate-like side,

each of said thickened lower ends providing a matrix receiving one of said rods in the said thickened end portion of each said rib,

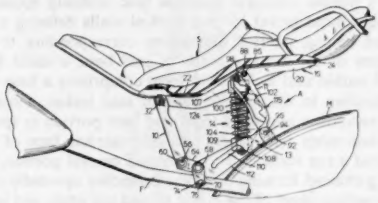
and spaced webs integrally attached to the sides of said ribs acting as stiffeners for said ribs.

4,103,858

SEAT SUPPORT ASSEMBLY FOR A RECREATIONAL VEHICLE

Richard F. Swenson, Milwaukee, Wis., assignor to Milsco Manufacturing Company, Brown Deer, Wis.

Filed Jul. 21, 1977, Ser. No. 817,574
Int. Cl.[2] A45D *19/04*
U.S. Cl. 248—399 **5 Claims**



1. A seat supporting assembly for use in a vehicle to resiliently support a seat, said seat supporting assembly comprising: at least a pair of spaced apart pivotable arms, including a forward arm and a rearward arm, each of said arms including an upper end pivotably connected to said seat and a lower end pivotably connectable to said vehicle for supporting said seat for generally vertical movement, and said rearward arm including a longitudinally extending slot therein; and a spring assembly for resiliently supporting said seat and including a lower end pivotably supportable by said vehicle intermediate said lower ends of said forward arm and said rearward arm, said assembly including an upper end shiftably supported by said longitudinal slot wherein said spring assembly is moveable between a substantially vertical position where said seat is resiliently supported by said spring assembly to a position wherein said spring assembly extends rearwardly and wherein said upper end of said spring assembly is received adjacent to said lower end of said rearward arm wherein the amount of resilient support of said seat by said spring assembly is reduced, said spring assembly including a pair of spaced apart parallel shafts, and a telescoping strut having a connection at each of its ends with said shafts, said connections between said strut and shaft shafts, and including a non-circular opening in said strut means and said shafts have a correspondingly shaped end portion inserted in said opening for preventing relative rotation between said shafts, and spring means mounted between said shafts for resiliently supporting said vehicle seat.

4,103,859

LINEAR SUPPORT APPARATUS

Jerald L. Brown, Oklahoma City, and John J. Shelton, Tuttle, both of Okla., assignors to Fife Corporation, Oklahoma City, Okla.

Continuation of Ser. No. 606,127, Aug. 20, 1975, abandoned. This application Dec. 17, 1976, Ser. No. 751,743
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—425 **11 Claims**

1. An apparatus for pivotally supporting a frame for rotation of the frame relative to a selected axis of pivotation, comprising:

a plurality of connectors connected to the frame at pivot support points; and

linear means for supporting the connectors, each connector movable along a respective axis of travel defined as passing through its respective pivot support point and through a travel axis convergence point, the axis of travel for each connector passing through the travel axis convergence

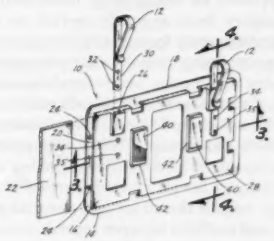
point, all of the pivot support points and the travel axis convergence point characterized as being on the circumference of a reference circle when the frame is positioned in a reference mode, the reference circle intersecting the axis of pivotation at an initial pivotation center which is located at one end of a reference diameter of the reference circle, the travel axis convergence point being located at the other end of the reference diameter.

4,103,860

MIRROR HOLDER

Charles A. Haas, and John E. Schenken, both of 420 E. Grand Ave., Des Moines, Iowa 50309

Filed Feb. 14, 1977, Ser. No. 768,285
Int. Cl.[2] A47G *1/17*
U.S. Cl. 248—467 **8 Claims**



1. A mirror holder comprising,

a molded support structure having a front and back wall with a slot therebetween having one open end for slidably removably receiving a mirror therethrough for securement between said front and back walls, said slot having lateral edges,

one of said front and back walls having at least one node at said open end of said slot for blocking said open end and holding said mirror in place;

said node being spaced inwardly from said lateral edges and having an angularly disposed camming surface positioned to engage said mirror and cam said mirror outwardly away from said one wall during insertion,

the other of said front and back walls having sufficient flexibility to be flexed outwardly away from said one wall in response to said camming action of said mirror against said camming surface of said node during insertion;

said front wall having an opening therein exposing said mirror; and

means associated with said support structure for attaching said support structure to another supporting surface.

4,103,861

ARRANGEMENT FOR THE SECTIONAL CANTILEVER PROJECTION OF MULTI-PANEL BRIDGE SUPPORTING STRUCTURES OF STEEL OR PRESTRESSED CONCRETE

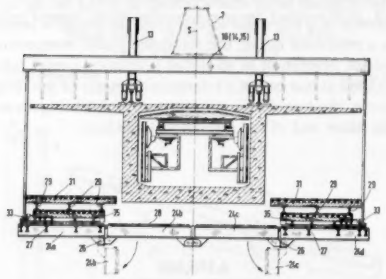
Wilhelm Büchler, Munich; Gotthard Müller, Aschheim, and Hans-Joachim Mende, Munich, all of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Germany

Filed Feb. 17, 1977, Ser. No. 769,729

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1976, 2607805

Int. Cl.[2] E01D *1/00*

U.S. Cl. 249—20 **11 Claims**



10. An arrangement for projecting cantilever sections of multi-sectional bridge supporting structures of steel and concrete and/or prestressed concrete forming a superstructure which is supported on bridge piles, comprising at least one traveling auxiliary beam movably carried on and arranged above said superstructure for spanning between superstructure sections, two concreting scaffolds each comprising a supporting part having crossbeams and rollers arranged above said superstructure, said rollers riding on rails positioned above said superstructure, a platform suspended from said supporting part of said scaffolds and arranged below said superstructure for carrying casings for extending said projecting superstructure sections, a transport device movably carried on said auxiliary beam so as to support therefrom said concreting scaffolds for transporting said scaffolds between superstructure sections and from completed sections to a bridge pile for beginning construction of the next section, said supporting part of each concreting scaffold having longitudinal girders arranged adjacent said auxiliary beam, said crossbeams of said supporting part being connected to said longitudinal girders and arranged below said auxiliary beam, a pair of retractable supporting blocks supporting said auxiliary beam on a pile next succeeding a completed superstructure section, said supporting blocks being alternately retractable to allow passage of said crossbeams of said supporting part when said scaffold is transported to said next succeeding bridge pile, said platform of said scaffolds comprising a bending resistant lattice formed by a plurality of longitudinally extending platform girders and a plurality of platform crossbeams extending transverse to said platform girders, each of said platform crossbeams having inner and outer parts, said innr parts being movable with respect to said outer parts to permit the formation of openings in said platform corresponding to the width of a bridge pile to allow said platform to pass said pile as it is transported to the next section, and one of said concreting scaffolds having a forked rear portion, wherein the other of said concreting scaffolds has a rear portion arranged to be complementarily fit within said forked rear portion of the other of said concreting scaffolds.

4,103,862

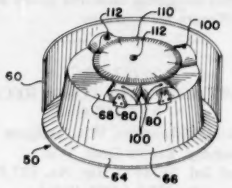
APPARATUS FOR PRODUCTION OF PRECAST MANHOLE BASES

Wayne O. Moore, P.O. Box 961, Mt. Vernon, Ill. 62864

Filed Apr. 25, 1977, Ser. No. 790,547

Int. Cl.[2] B28B *7/02*

U.S. Cl. 249—53 R **7 Claims**



1. In a precast concrete manhole base molding apparatus including a mold jacket having vertical walls defining a top edge and having interior dimensions corresponding to the dimensions of the exterior walls of said base, a mold form disposed within said jacket, said form comprising a base portion extending to the interior face of said jacket, a central portion extending upwardly from said base portion in spaced apart relationship with respect to said interior face of said jacket, and a top surface defined by said central portion, and including channel forming members extending upwardly from said top surface short of the extent of said top edge, and insert members extending outwardly from the central portion into abutting relationship with said jacket and positioned in line with said channel forming members, the improvement wherein said channel forming members comprise a first effluent channel forming member, means associated with said first member and said top surface attaching said first member in a fixed location on said top surface, said first member having one end positioned on the outer periphery of said top surface, and said first member extending inwardly from said one end to an opposite end at the center of said top surface, and including at least one additional channel forming member extending radially outwardly from said opposite end of said first member to the periphery of said top surface, said first member comprising a channel section extending inwardly from said one end and an enlarged basin section positioned at the center of said top surface, said additional channel forming member being positioned in engagement with said basin section, said additional member being movable over said top surface to thereby vary the angular relationship between said first member and said additional member, and including means associated with said additional member and said top surface locking said additional member in position on said top surface after a desired angular relationship is achieved.

4,103,863

ACTUATOR FOR EXPANDING GATE VALVES

Robert C. Houlgrave, and Larry J. Talafuse, both of Houston, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 567,573, Apr. 14, 1975, abandoned. This application Oct. 4, 1976, Ser. No. 729,324

Int. Cl.[2] F16K *31/122*

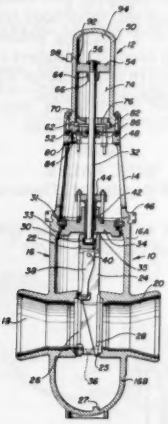
U.S. Cl. 251—48 **10 Claims**

1. A gate valve and actuator assembly therefor, particularly adapted for high temperature service over around 450° F. comprising:

a gate valve body having a main flow passage therethrough and spaced seats therein about the flow passage, an expanding gate assembly within said body between the seats including a gate valve member having a notch on one face thereof and a segment movably mounted in said notch and carried on said gate valve member, said gate valve mem-

ber and segment having an opening in a lower portion thereof alignable with said flow passage in a retracted position, an operating stem secured to the gate valve member for movement therewith, said gate valve body including a stop therein for limiting movement of said segment when moved to an extended closed position of said gate valve member;

a gas-hydraulic valve actuator mounted on the gate valve adjacent an upper end of said valve stem, said valve actuator including a cylinder with a piston therein secured to the upper end of said stem forming a hydraulic fluid chamber with hydraulic fluid on the lower side of said piston and a closed gas chamber with pressurized gas on the upper side of said piston to urge said piston and said stem continuously to the extended closed position of the gate valve; and



said actuator including means to meter hydraulic fluid flowing from the cylinder to slow the rate of travel of said stem adjacent the end of travel of the gate member to extended position, said means to meter permitting a fast rate of travel of said gate valve member and decelerating the movement of said gate valve member and segment between around ¾ inch and three inches from said stop, the metering of fluid by said means to meter providing a relatively slow rate of travel when the segment engages the stop to minimize the slamming action of the segment against the stop, said gate valve member moving downwardly after said segment has been stopped to provide lateral expansion between the gate valve member and segment for fluid-tight metal-to-metal sealing engagement with the seats, said means to meter thereby permitting a relatively slow expansion of the gate assembly to fully seated position while permitting the gate assembly to move to an extended position in a minimum of time.

4,103,864

HYDRAULIC POSITIONER FOR VALVES

Heinrich Hagendorn, Wesel, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 27, 1976, Ser. No. 754,358

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1975, 2558959

Int. Cl.[2] F16K *31/122*

U.S. Cl. 251—63.6 **10 Claims**

1. A hydraulic positioner for a valve or the like comprising:

(a) a housing;

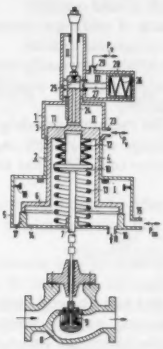
(b) a stepped differential piston disposed within said housing for motion therein;

(c) a coupling member coupled to act on the valve;

(d) a closing spring disposed inside said piston and acting between said piston and said coupling member in a first direction;

(e) an opening spring disposed within said housing between the bottom of said housing and said coupling member acting in a second direction opposite said first direction;

(f) a hydraulic latching system supplied with an oil pressure coupled to act on said differential piston so as to hold said



opening and closing springs cocked against each other when said oil pressure is present, at the same time holding said coupling member, in a first, normal position, whereby, if said oil pressure drops, said closing spring is first released causing said differential piston to move upward whereafter said opening spring is free to move said coupling member from said first position to a second position suddenly.

4,103,865

BALL VALVE

Kamori Nanba; Tomoyuki Ueda, and Tetsunori Matsuda, all of Nobeoka, Japan, assignors to Asahi Yukizai Kogyo Kabushiki Kaisha, Nobeoka, Japan

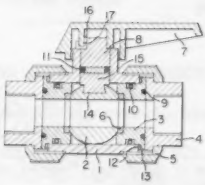
Continuation of Ser. No. 605,838, Aug. 19, 1975, abandoned.

This application Jun. 18, 1976, Ser. No. 697,529

Claims priority, application Japan, Aug. 24, 1974, 49-100790

Int. Cl.[2] F16K *5/06*

U.S. Cl. 251—148 **1 Claim**



1. A ball valve comprising:

a valve body having a substantially cylindrical internal wall, a substantially cylindrical external wall, and substantially flat radially extending end faces;

a valve ball within said valve body, said ball being rotatable for controlling fluid flow therethrough and having a trapezoidal groove defined therein;

a carrier on each side of said ball, each of said carriers comprising:

a substantially cylindrical section having a diameter substantially equal to that of the internal wall of the valve body and extending into said valve body, said section having a first substantially circular recess defined in the outer periphery thereof;

a substantially straight radially outwardly extending flange of an outer diameter greater than that of the internal wall of the valve body but less than that of the external wall of the valve body; and

a substantially flat radially extending end face defined in part by said flange, said end face having a second substantially circular recess defined therein;

a seat packing in direct contact with and positioned between the ball and each of said carriers;

two body caps, each of said caps comprising:

a substantially cylindrical section;

a substantially radially outwardly extending flange of an outer diameter substantially equal to that of the flanges of the carriers; and

a substantially flat radially extending end face, defined in part by the flange of the body cap, which abuts flush with a respective one of the flat end faces of the carriers;

a first O-ring in each of said first recesses for sealing any space between said carriers and the internal wall of said valve body;

a second O-ring in each of said second recesses for sealing any space between the end faces of said carriers and the corresponding end faces of said body caps;

an annular elastic seat gasket, sandwiched between the flange of each of said carriers and a respective one of the end faces of the valve body, for absorbing stress caused by thermal expansion which would otherwise be transmitted from the carriers to the ball;

two cap nuts, each of said nuts having a substantially cylindrical section threadingly engagable with a respective end of the valve body and a radially inwardly extending flange which abuts a respective one of the flanges of the carriers;

a stem having a trapezoidal protuberance positioned in said trapezoidal groove; and

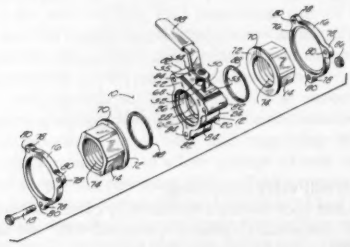
a handle engaged with said stem for rotating the ball via said stem whereby the valve ball can be easily changed by removing the cap nuts from the valve body, withdrawing the carriers from the valve body, disengaging the valve ball from the trapezoidal protuberance on the stem and removing the ball from the valve body.

4,103,866

BUTTERFLY VALVE

Bernie E. Robinson, Milwaukee, Wis., assignor to Milwaukee Valve Company, Inc., Milwaukee, Wis.

Filed Jan. 10, 1977, Ser. No. 758,066
Int. Cl.[2] F16K *1/22*
U.S. Cl. 251—151 **12 Claims**



1. A butterfly valve adapted to be mounted between axially spaced tubular sections of a fluid system comprising

a pair of tailpieces, each adapted to be mounted on the end of one of the tubular sections and having a radially extending flange including an inner face;

a pair of annular clamping members, each adapted to fit over and slidably encircle one of said tailpieces and including a plurality of circumferentially spaced apertures, said apertures of one clamping member being axially alignable with the apertures of the other clamping member;

a valve unit including

a valve body having opposed end faces fitting between said tailpiece inner faces in face-to-face relationship, a bore defining a flow passage extending between said end faces, and a plurality of circumferentially spaced apertures located on the outer periphery thereof and axially alignable with said clamping member apertures, and

a valve member mounted in said valve body bore for rotation about an axis extending transversely of said flow passage between an open position and a closed position to shut off flow through said flow passage; and

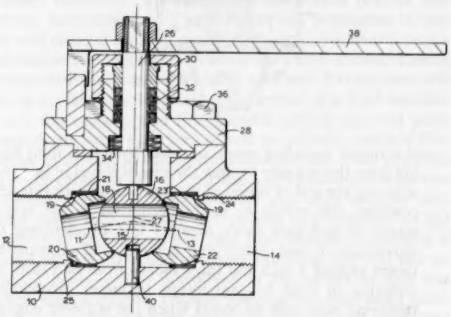
mounting means extending through said clamping member apertures and said valve body apertures for supporting said valve unit between said tailpieces and for moving the inner faces of said tailpieces into clamping engagement with the end faces of said valve body when said mounting means is moved to a clamping position, whereby said valve unit and said clamping members can be rotated as a subassembly relative to said tailpieces when said mounting means is in an unclamping position.

4,103,867

BALL VALVE

James Douglas Orr, 355 Rayette Rd., Concord, Ontario, Canada (L4K IBI)

Filed Feb. 4, 1977, Ser. No. 765,874
Int. Cl.[2] F16K *25/04*
U.S. Cl. 251—180 **4 Claims**



1. A valve comprising:

a housing having a flow passage;

a spherical flow control ball having a flow passage;

a pair of tubular sealing members each having a flow passage and a spherical outer wall;

the spherical outer wall of said tubular sealing members being seated in said flow passage of said housing for rotational movement about the centres of their respective spherical surfaces and with their flow passages generally aligned with the flow passage of the housing;

said control ball being between said tubular sealing members and having its surface in sealing engagement with an end of the passage of each sealing member;

means for maintaining said control ball and sealing members in spaced relation longitudinally of the flow passage of the housing with the centers of the control ball and centers of the sealing members in triangular relation, the centers of said spherical surfaces of said sealing members being below the center of said control ball whereby a downward force on said control ball and through its center causes a rotational force on said sealing members and tightens the engagement of the ends of the passages of the sealing members with the spherical surface of said ball;

a stem keyed to said control ball and extending exteriorly of said housing that is rotatable to align or disalign the flow

passage of the control ball with the flow passage of the housing and sealing members to control flow; and

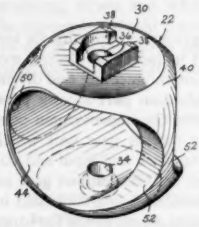
means for maintaining a downward force on said control ball through its center to maintain a rotational force on said sealing members and maintain them in sealing contact with said control ball.

4,103,868

BALL VALVE HAVING AN IMPROVED BALL ELEMENT DESIGN

William S. Thompson, Elkhart, Ind., assignor to Elkhart Brass Manufacturing Co., Inc., Elkhart, Ind.

Filed Dec. 29, 1976, Ser. No. 755,269
Int. Cl.² F16K 5/06
U.S. Cl. 251—283 **3 Claims**



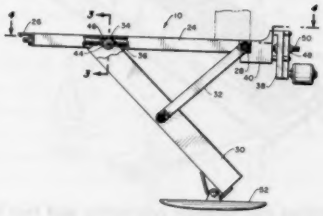
1. A ball valve to accommodate liquid flow comprising a housing having a chamber therein, said housing including an inlet into said chamber and an outlet from said chamber, a ball element in said chamber positioned between said inlet and outlet, handle means located exteriorly of said housing and contacting said ball element for rotating the ball element upon an axis between closed and full open positions, one of said inlet and outlet defining a valve seat, said ball element having a circumferentially located generally spherical outer surface extending radially about said axis of rotation, said ball element having a liquid flow passage therethrough formed by a continuous side wall, said ball element flow passage intersecting said axis of rotation and interrupting said outer surface of the ball element at spaced locations to define first and second opening edge portions into the ball element, said ball element flow passage being aligned with said inlet and outlet when said ball element is in its full open position to permit liquid flow from said inlet and through said outlet, each of said opening edge portions having a beveled reaction face means constituting an arcuate surface located laterally of said axis of rotation for making contact with liquid flow when said ball element is rotated between its closed and full open positions, said reaction face means of both opening edge portions converging toward each other from said opening edge portions and terminating at said ball element outer surface, said reaction face means of both opening edge portions interrupting said flow passage side wall at spaced locations, said ball element including spaced ends intersecting said axis of rotation, said ball element outer surface located between said ends, each reaction face means extending from adjacent one end to the other end of said ball element with the spacing between the reaction face means of both opening edge portions and said ball outer surface varying from a maximum adjacent each ball element end to a minimum at a location between said ball element ends.

4,103,869

VEHICLE LEVELLING AND STABILIZING SYSTEM

Philip R. Mesny, 20233 Parthenia, Canoga Park, Calif. 91306, and Jake E. Peoples, 5034 Cahuenga Blvd., North Hollywood, Calif. 91601

Continuation of Ser. No. 759,319, Jan. 13, 1977, abandoned. This application Nov. 25, 1977, Ser. No. 854,934
Int. Cl.² B66F 7/24
U.S. Cl. 254—86 R **4 Claims**



1. A levelling and stabilizing jack system for retrofitting to vehicles such as campers, trailers and the like comprising:

a plurality of separately mounted, reversible, horizontal folding jacks with extendable and retractable jack legs mounted at strategic locations on said vehicle,

said jacks comprising:

an elongate channel,

a worm gear traversing the length of said channel,

an elongate jack leg swingable from a position parallel with said channel to a substantially vertical position,

a trunnion connecting said leg to said worm gear having bushings between the trunnion and said leg for preventing said trunnion from binding on said worm gear,

a hexagonal shaft attached to said worm gear and extending beyond one end of said channel means,

a gear box engaging the end of said hexagonal shaft,

an electric motor for connecting to a vehicle battery for driving said worm gear,

a symmetrical reversible gear box motor mount attached to said channel means for adapting said motor and gear box arrangement so that said jack system may be adapted to mount at a variety of locations on said vehicle,

selective means for selectively operating said jacks individually or in predetermined groups or pairs,

means for securing said plurality of jack systems at convenient locations on said vehicle.

4,103,870

INSTRUMENT FOR SETTING A NON-SKID CHAIN ON A CAR TIRE

Keisuke Murakami, 2-22-3 Megurohon-cho, Meguro-ku, Tokyo, Japan

Filed Aug. 12, 1977, Ser. No. 825,164
Int. Cl.² E02C 3/00; B60C 27/00
U.S. Cl. 254—88 **7 Claims**

1. Apparatus for mounting a chain on a tire comprising:

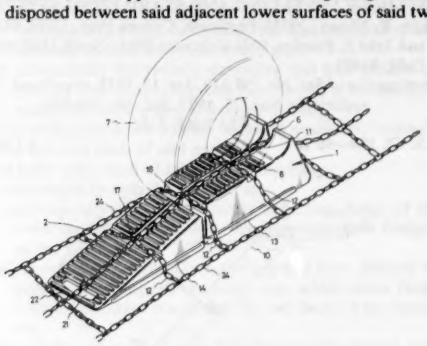
(a) a bed adapted to be placed on the ground and having a mounting surface for placing the tire thereon, said mounting surface having a longitudinal groove and a plurality of transverse grooves therein for placing a chain therein,

(b) said bed consisting of first and second bed sections respectively having flat and inclined surfaces cooperating to form said mounting surface of said bed, said grooves in said mounting surface of the bed defining perpendicularly intersecting grooves in both the flat and inclined surfaces of said bed sections,

(c) said grooves being of sufficient size to allow said chain to be accommodated therein for longitudinal and transverse movement with the tire on the mounting surface,

(d) said first and second bed sections having adjacent lower

surfaces, said apparatus further including hinge means disposed between said adjacent lower surfaces of said two



bed sections and hingedly connecting said two bed sections for allowing said bed to be folded.

4,103,871

WIRE ROPE BINDER

W. W. Patterson, III, and Eugene F. Grapes, both c/o W. W. Patterson & Company, 830 Brocket St., Pittsburgh, Pa. 15233

Division of Ser. No. 618,807, Oct. 2, 1975, Pat. No. 4,062,520, which is a division of Ser. No. 399,826, Sep. 24, 1973, Pat. No. 3,934,855. This application Nov. 1, 1976, Ser. No. 737,171
The portion of the term of this patent subsequent to Jan. 27, 1993, has been disclaimed.
Int. Cl.[2] A63B *61/04*
U.S. Cl. 254—164 **2 Claims**

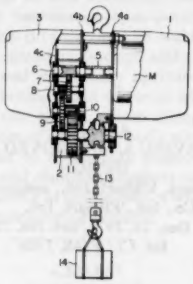
1. A wire rope binder apparatus comprising a wire rope of given length, a clamp having a body through which the wire rope extends adjustable on said wire rope to any position on its length with respect to one end thereof and having a threaded tubular extension thereon, threaded substantially over its length, through which the other end of said wire rope coaxially projects, a frame means having an opening through which the tubular extension on the clamp extends, and nut means screwed on said threaded tubular extension adjustably bearing against said frame means for pulling said clamp relative to said frame means to apply a tensioning force to said other end of said wire rope and means on said frame for attachment to a second object spaced from said first object and means in said body adapted to grip the wire rope on tensioning the wire rope, a winch having means for supporting it in a fixed position on a first object, and to which said one end of the wire rope connects for applying a tension force to said wire rope.

4,103,872

OVERLOAD PROTECTION APPARATUS FOR HOISTING MACHINE

Koki Hirasuka, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 2, 1977, Ser. No. 764,892
Claims priority, application Japan, Feb. 2, 1976, 51-9325
Int. Cl.[2] B66D *1/00*
U.S. Cl. 254—168 **5 Claims**



1. In an overload protection apparatus for hoisting machines having a driving part including an electric motor, an output, and a reduction part interconnecting said driving part and said output, with said reduction part having parallelly disposed input and output shafts, the improvement comprising: a slipping gear unit and a ratchet gear unit which are mounted drivingly connected between said input and said output shafts, said slipping gear unit and said ratchet gear unit respectively having outer ring gears engaging with said input shaft, said slipping gear unit having means to slip for torques exceeding a predetermined torque, said ratchet gear unit having ratchet means to engage its ring gear when said output shaft is rotated in a direction for lowering the load carried by said hoisting machine at a speed exceeding a predetermined speed, said slipping gear unit ring gear having inwardly extending protrusions, gear retaining plates for clamping said ring gear at its opposite sides and a spring acting between said protrusions and said plates for biasing said protrusions and said plates to one extreme position of limited relative lost motion and being compressed as said protrusions and said plates move to the opposite extreme position of the limited relative lost motion when transmitting torque between said input shaft and said output shaft.

4,103,873

OVERLOAD PROTECTION APPARATUS FOR HOISTING MACHINE

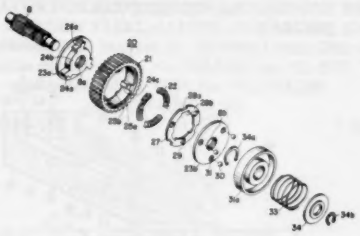
Isao Sato; Shigenori Gomi, and Mitsuyuki Furuichi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 18, 1977, Ser. No. 778,934
Claims priority, application Japan, Apr. 2, 1976, 51-36955
Int. Cl.[2] B66D *1/00*
U.S. Cl. 254—168 **6 Claims**

1. In an overload protection apparatus for hoisting machines having a driving section including an electric motor, an output, and a reduction section interconnecting said driving section and said output, with said reduction section having parallelly disposed input and output shafts, the improvement comprising:

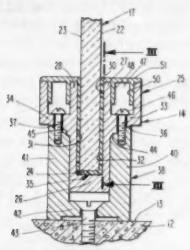
a gear drivingly mounted and connected between said input and output shafts, said gear including an outer gear unit having peripheral gear for engagement with a pinion and an inner gear unit constituted by first and second gear support means facing to each other and housed by said outer gear unit, said first and second gear supporting means have respective projecting members, said first and second gear supporting means abutting each other at their

projecting members to provide a power transmission path to raise the load, spring means disposed between said first and second gear support means and in contact with said outer gear unit, said spring means being adapted to allow a relative movement of said inner and outer gear units when the load torque actually applied exceeds a predetermined torque in the direction of rotation applied to raise



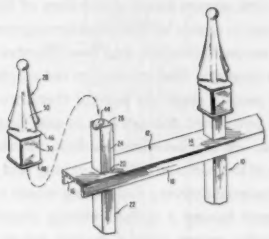
the load, means for converting the relative movement in the direction of rotation into a movement in the direction of thrust, and means for detecting the movement caused by said converting means and wherein said means for detecting the movement of said converting means effects a stopping of the lifting operation upon the movement of said converting means in the direction of thrust.

4,103,874
RAILING ASSEMBLY
William J. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.
Filed Sep. 26, 1977, Ser. No. 836,408
Int. Cl.[2] E04H *17/16*
U.S. Cl. 256—24 **7 Claims**



1. A railing assembly comprising a handrail, railing mounting means for connecting the handrail to a building structure, and handrail supporting means connecting said mounting means and said handrail; said handrail supporting means comprising at least one panel, said railing mounting means comprising bracket means in the form of a channel member having an upwardly opening channel therein, the lower edge portions of said panel being disposed within said channel, with the channel member having portions that extend up along lower opposite sides of the panel in bracketing relation therewith, and tape means disposed in said channel between said upwardly extending portions of said channel and said lower opposite sides of said panel, said tape means including a plurality of upwardly extending spaced apart strip portions defining therebetween upwardly opening adhesive-receiving voids, for receiving a liquified adhesive therein, and with a panel-securing adhesive disposed in said voids.

4,103,875
SPEAR POINTS FOR FENCE STRUCTURE AND METHOD
Carl R. Glass, 2749 N. Orange Blossom Trail, Kissimmee, Fla. 32741
Continuation of Ser. No. 612,521, Sep. 11, 1975, abandoned. This application Oct. 1, 1976, Ser. No. 728,708
Int. Cl.[2] E04H *17/14*
U.S. Cl. 256—59 **1 Claim**



1. In a fence construction which includes a longitudinal stringer, and a plurality of substantially vertical metallic posts, said posts being substantially rectangular in cross section, and having upper side portions and top walls, protective and decorative spear points for said posts, and wherein each point comprises:

a spear point body section having upper and lower portions;

the lower body section having top and bottom flanges;

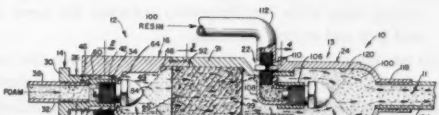
the lower body section having a substantially rectangular chamber, said chamber being defined by inner walls which are inclined from the vertical so that the chamber is of increased dimension at its entry portion;

the chamber having flat top walls;

a spear point section projecting integrally, vertically from the upper portion of each body section;

the body section and spear point section being formed of resilient plastic material; and wherein for each post the lower body section being expandably engaged on the respective upper side portions of a corresponding post with the chamber expanded throughout its depth to frictionally engage the side portions along the complete axial length thereof, with the top wall of the post abutted against the flat top wall of the chamber and an epoxy mastic bonding substance on the end of the post receiving the spear point to permanently adhere the spear point thereon.

4,103,876
METHOD AND APPARATUS FOR CONTINUOUSLY PRODUCING AND APPLYING FOAM
Walter J. Hasselman, Jr., and Walter J. Hasselman, Sr., both of 1084 Post Rd., Scarsdale, N.Y. 10583
Filed Apr. 30, 1975, Ser. No. 573,120
Int. Cl.[2] B01F *5/04*
U.S. Cl. 366—178 **23 Claims**



1. An apparatus for homogeneously mixing materials comprising a first material delivery and mixing means having a feed opening, a first mixing chamber having a generally central axis,

first outlet means, and first nozzle means, said first nozzle means for delivering a stream of finely atomized spray of a first material in said feed opening in directions generally parallel and transverse to the central axis of said chamber, and said first delivery and mixing means for delivering into said feed opening a generally annular stream of a second material about the spray of the first material such that both the first and second materials flow in substantially the same general direction, wherein the first stream mixes in the core of the layer of the second material to enable intimate and homogeneous mixing of the first and second materials, said first chamber being dimensioned larger than said feed opening to reduce the flow rate of the first and second materials passing therethrough, and said outlet means positioned downstream of said first chamber and being dimensioned smaller than said first chamber to increase the flow rate of the admixed material exiting said first chamber; and second material delivery and mixing means including third assembly means having a second mixing chamber and third material delivery means with a second nozzle means being operatively connected downstream to said first chamber, said third assembly and delivery means forming the homogeneous admixture of the first and second materials into a generally annular stream which flows in substantially the same general direction with respect to the mixing chamber as the first and second materials, said second nozzle means for introducing a finely atomized spray of a third material into the approximate center of the annular layered admixed stream such that the third material also flows in directions generally parallel and transverse to the annular stream of admixed first and second materials, thereby enabling the homogeneous admixture of the first, second and third materials in said second chamber, said second chamber being dimensioned larger than said outlet means to reduce the flow rates of the admixed stream and third material passing therethrough, means associated with said third assembly means to discharge the resultant admixture in substantially the same general direction as the first, second and third materials.

12. A process for manufacturing a foam material or the like comprising the steps of

(a) introducing into a first mixing zone a generally annular stream of a first gaseous material;

(b) introducing into the central portion of said first annular stream an atomized stream of a foam-forming material such that the foam-forming material flows in directions generally parallel and transverse to said first annular stream thereby causing substantially uniform and homogeneous intermixing of said materials;

(c) forming said admixed stream of first and second materials into a second generally annular stream;

(d) directing said generally annular stream into a second mixing zone while simultaneously reducing the speed of said first and second materials;

(e) introducing into the central portion of said annular admixed stream an atomized stream of a curable synthetic resinous material in directions generally parallel and transverse to said second annular admixed stream thereby causing said curable synthetic resinous material to become intermixed substantially uniformly with said annular admixed stream to form a substantially homogeneous synthetic resinous foam material; and

(f) directing said synthetic resinous foam material away from said second mixing zone.

4,103,877

DEVICE FOR THE FLAME TREATMENT OF A WORK-PIECE

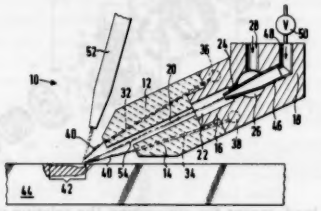
Alfred Pfeuffer, Neu-Isenburg, Germany, assignor to Messer Griesheim GmbH., Frankfurt am Main, Germany

Filed Nov. 22, 1976, Ser. No. 743,793

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1975, 2553553

Int. Cl.[2] B23K 7/06

U.S. Cl. 266—51 5 Claims



1. Device for scarfing of a metal work-piece, the combination with upper and lower preheating blocks disposed to define a scarfing-oxygen duct, holding means operable for holding said blocks, and including an oxygen distribution system in communication with said duct, and a separate nozzle communicating with said duct and operable for supplying an additional oxygen stream through said duct to the work-piece zone for ignition of said metal heating zone, said separate nozzle being arranged in an expansion chamber in the interior of said holding means and being connected to a separate supply line.

4,103,878

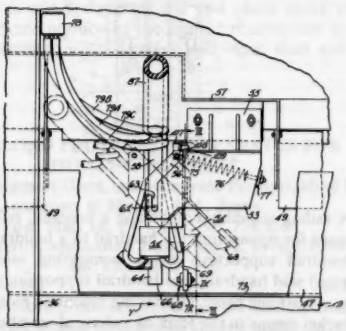
APPARATUS FOR REMOVING SOLIDS FROM THE WATER SEAL TROUGH OF AN ANNULAR MATERIAL COOLER

Richard W. Graef, Franksville, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 8, 1977, Ser. No. 822,699

Int. Cl.[2] C21D 11/00

U.S. Cl. 266—78 11 Claims



1. In an annular material cooler device having at least one gas seal water trough, an apparatus for removing solids from said water trough comprising;

an ejector pump mounted in said water trough having a body portion provided with a main bore having an inlet and an outlet, said inlet being immersed in the water of the water trough;

a source of air under pressure;

conduit means connecting said source of air under pressure to said ejector pump; and

control means operable when actuated to direct the air under pressure to said ejector pump to create a vacuum at the inlet thereof to draw solids from the water trough into said ejector pump and into the stream of air under pressure passing through said ejector pump to be expelled therefrom through said outlet.

4,103,879

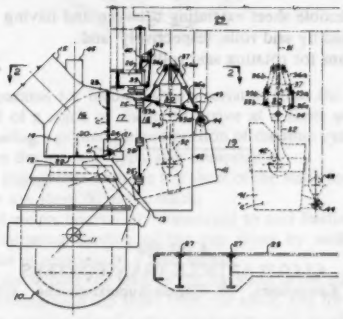
APPARATUS FOR CONTROLLING EMISSIONS FROM OXYGEN STEELMAKING FURNACES

Albert Calderon, 1065 Melrose Dr., Bowling Green, Ohio 43402

Continuation-in-part of Ser. No. 758,599, Jan. 12, 1977. This application Feb. 3, 1977, Ser. No. 765,208

Int. Cl.[2] C21C *5/40*

U.S. Cl. 266—158 **7 Claims**



1. In the controlling of emissions from a basic oxygen steelmaking furnace an improved apparatus comprising in combination the following:

(a) an overhead hood having an entry point located over the mouth of said furnace when said furnace is in its upright position,

(b) suction means to create a negative pressure within said hood,

(c) an extension means to said hood to protrude away from the axis of rotation of said furnace in such a way as to communicate with said hood by means of an aperture, said extension being positioned over the mouth of said furnace when said furnace is in the reclined position towards the charging aisle, and said extension having the top thereof removeable for access purposes, and

(d) gate means to selectively control the emission of gases from either said entry point of said hood or said aperture of said extension.

4,103,880

APPARATUS FOR HEAT TREATING DRILL BLANKS

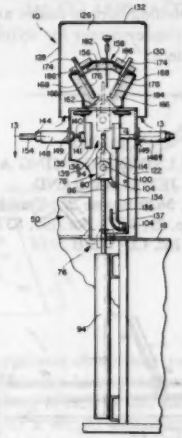
Herbert W. Westeren, Barrington, R.I., and Richard P. McCally, N. Attleboro, Mass., assignors to C. I. Hayes Inc., Cranston, R.I.

Filed Sep. 16, 1976, Ser. No. 723,704

Int. Cl.[2] C21D *1/12*

U.S. Cl. 266—253 **21 Claims**

1. Apparatus for automatically heat treating a plurality of elongated articles, wherein each of said articles includes a first portion and a second portion, comprising a base, a feeding assembly mounted on said base and including means for feeding a predetermined number of said articles to a pick-up station located on said base, a furnace housing mounted on said base in spaced relation with respect to said pick-up station and having a heating chamber and a cooling station located in spaced vertical relation therein, said cooling station being spaced above said pick-up station in vertical alignment therewith, and said heating chamber being spaced above said cooling station in vertical alignment therewith and said pick-up station, and a transfer mechanism mounted on said base and including a jaw assembly for receiving the first portion of a plurality of said articles therein at said pick-up station and a lift device for moving said jaw assembly and the articles retained therebetween from said pick-up station through said cooling station



and to said heating chamber, wherein only the second portion of said articles are exposed for the heat treatment thereof, said lift device thereafter moving said articles to said cooling station for a preselected interval for the cooling thereof, whereafter the treated articles are returned to the pick-up station for removal therefrom to a collection station.

4,103,881

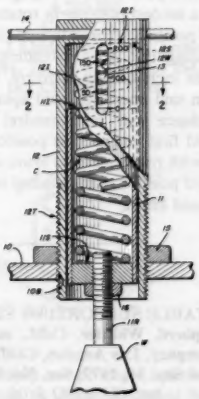
LOAD REGULATOR

Irene C. Simich, 5555 N. Sheridan Rd., Chicago, Ill. 60640

Filed Sep. 13, 1976, Ser. No. 722,658

Int. Cl.[2] F16F *1/12*

U.S. Cl. 267—177 **7 Claims**



1. In a machine arrangement for accurately setting the load applied to a workpiece, an improved load regulator mounted to act between the machine and the workpiece for applying a load to the workpiece and comprising cooperating piston and cylinder means defining a variable length chamber, a coil spring disposed in the chamber to react between the piston and cylinder means and change in length in unison therewith for applying a load from the piston means to the workpiece, said piston and cylinder means having cooperating cylinder indicia

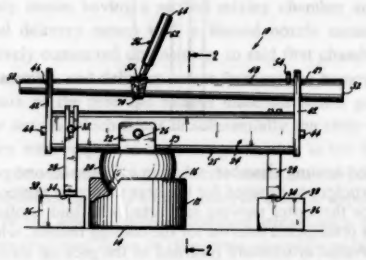
and piston indicia arranged to indicate the value of the load in proportion to the length of the coil spring, and means to axially adjust the position of the cylinder means relative to the machine in accordance with the value registered by the indicia to set the load applied to the workpiece by the piston means, said cylinder means having external threads engageable with a threaded machine mounting bore to enable axial adjustment of the position of the cylinder means for setting the load to be applied to the workpiece.

4,103,882

APPARATUS FOR USE IN FORMING A FINISH ON A JEWELRY BAND

Abraham Winzelberg, 3620 Bowne St., Flushing, N.Y. 11354

Filed Sep. 29, 1977, Ser. No. 837,852
Int. Cl.² B25B *5/14*
U.S. Cl. 269—51 **2 Claims**



1. Apparatus for use in forming a finish on a jewelry band comprising: a base; a chassis rotatably mounted to said base; first locking means for securing said chassis in position relative to said base; a mandrel, said mandrel being shaped in the form of a frustum of continuously increasing cross-sectional area, said mandrel further having a substantially circular cross section; and positioning means operable selectively to move said mandrel from a first position in disengageable relation to said jewelry band to a second position in rotatable relation to said chassis to a third position secured to said chassis, said positioning means including two arms extending from said chassis, each of said arms including an aperture, said mandrel being suspended within said apertures, said apertures being dimensioned in accordance with said mandrel so that when said mandrel is in said first and second positions, said mandrel is freely rotatable with respect to said arms, and when said mandrel is in said third position, said mandrel is secured in position with respect to said arms.

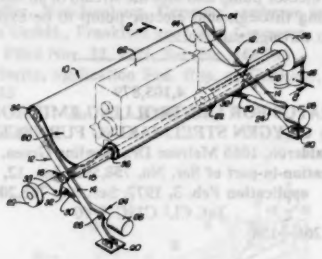
4,103,883

ADJUSTABLE SUPPORTING STRUCTURE

Willard W. Shepherd, Whittier, Calif., assignor to Shepherd Machinery Company, Los Angeles, Calif.

Filed Sep. 14, 1977, Ser. No. 833,155
Int. Cl.² B23Q *3/00*
U.S. Cl. 269—71 **4 Claims**

1. In an adjustable supporting structure, the combination of:
(a) two end frames each comprising frame members having upper ends and each having means pivotally mounting said frame members thereof below their upper ends;
(b) two adjustable-length spacing means respectively having ends connected to said frame members of said end frames, respectively, for varying the spacings of said upper ends of said frame members;
(c) laterally spaced rolls extending longitudinally between said end frames and rotatably mounted on said upper ends of said frame members;



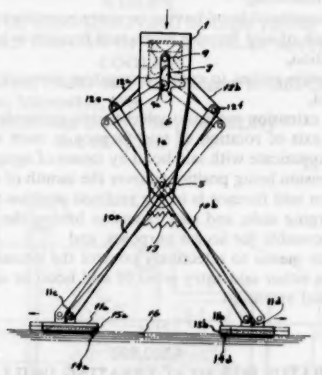
(d) a flexible sheet extending between and having portions carried by said rolls, respectively; and
(e) means for rotating said rolls.

4,103,884

CLOTH ARTICLE TRANSPORTERS

Yoshiro Kawashima, 18 Higashikomazume-cho, Gifu City, Japan

Filed Jan. 10, 1977, Ser. No. 758,189
Int. Cl.² B65H *3/22*
U.S. Cl. 271—18.3 **5 Claims**



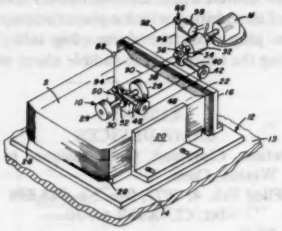
1. A transporter for a cloth article which comprises a body member adapted to be moved up and down, a pair of spaced plates carried by said body member, a bias means to urge said pair of spaced plates towards each other, needle members extending downwardly from each of said plates, a first means for moving said body member downwardly so that the needles in the plates can pierce a cloth article placed thereunder, a second means for moving said plates away from each other, a locking means coupled to and actuated by said first means to arrest the inwardly displacement of said spaced plates upon a downward movement of said body member and upon the next downward movement of said body member to automatically release said spaced plates and allow said bias means to move said spaced plates together, and a third means for moving said body member for selected vertical and horizontal distances, respectively.

4,103,885

TIMING MECHANISM FOR SHEET FEED APPARATUS

Richard Samuel Fox, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 2, 1977, Ser. No. 830,255
Int. Cl.[2] B65H 3/06
U.S. Cl. 271—117 9 Claims



1. Apparatus for feeding sheets seriatim from the variable top level of a stack of sheets to arrive at a sheet utilization device during a predetermined portion of the time cycle of the utilization device, said apparatus comprising:

means engageable with the top sheet of the stack for feeding such top sheet from the stack;

control means operatively connected to said feeding means for initiating feeding of the top sheet by said feeding means in response to a feed signal;

means for sensing the level of the top sheet in the stack prior to feeding such top sheet from the stack, and for producing a position signal corresponding to such level; and

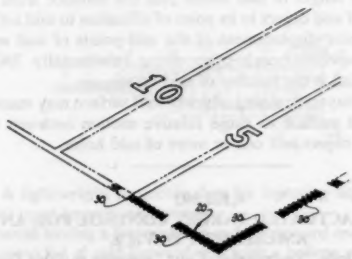
means responsive to said position signal for producing a feed signal, the timing of which varies in accordance with said position signal, and for applying such feed signal to said control means so that the top sheet arrives at the sheet utilization device during said predetermined portion of said time cycle regardless of the level of the stack from which the sheet is fed.

4,103,886

PERMANENT ATHLETIC FIELD MARKER

Carl W. Eley, Rte. 1, Zanesfield, Ohio 43360

Filed Mar. 14, 1977, Ser. No. 777,399
Int. Cl.[2] A63C 19/06
U.S. Cl. 272—3 2 Claims



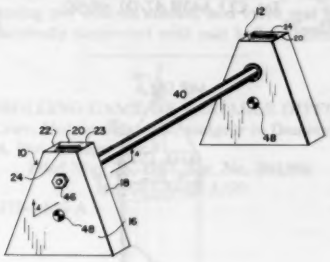
1. In combination, an athletic field and a permanent type of athletic field boundary marker comprising an elongated relatively narrow strip comprised of a flexible elongated base portion including a plurality of integrally formed and closely spaced upstanding projections, said projections having a height significantly greater than the depth of said base portion and having rounded tip portions, said base portion and projections being buried underground in said athletic field with only the tip portions of said projections being visible to clearly define a boundary marker when viewed from above ground.

4,103,887

BARBELL WITH COLLAPSIBLE LOAD CARRYING CHAMBERS

Renald Shoofler, 777 Greene Ave., Montreal, Quebec, Canada (H4C 2J8)

Filed Feb. 28, 1977, Ser. No. 772,350
Int. Cl.[2] A63B 13/00
U.S. Cl. 272—123 7 Claims



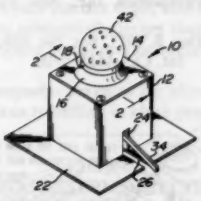
1. Exercising apparatus comprising two collapsible enclosures, each said enclosure having side walls and an end wall base, a walled opening in each of said enclosure side walls for receiving the end of a weight supporting bar, a support bar connecting said enclosures, the center of gravity of each of said enclosure being positioned between each said base and each said walled opening, an openable and closable aperture in each of said enclosures opposite the end wall base, each said wall opening and the center of gravity of each said enclosure being positioned in between each said aperture and each said base, each said side wall being flexible and composed of flexible polymeric material, each said side wall extending from the base to said aperture, each said openable and closable aperture comprising a slit in a wall of said enclosure, resilient means extending around the periphery of each of said apertures to resiliently bias said slit to a closed position to retain a weighted substance in each said enclosure.

4,103,888

GOLF TEE

Joseph H. Ricketts, 1 Lindenwood Ter., Ambler, Pa. 19002

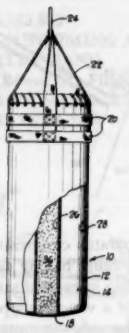
Filed Dec. 28, 1976, Ser. No. 754,967
Int. Cl.[2] A63B 57/00
U.S. Cl. 273—33 1 Claim



1. A golf tee assembly comprising a hollow housing, a support for said housing, an aperture in said housing, a sleeve extending from said aperture, said sleeve having a passage therethrough in communication with said aperture, a lip surrounding said passage at that end of said sleeve which is remote from said aperture, said lip being constructed and arranged to support a golf ball upon said sleeve above said passage, a piston in said housing movable toward and away from said aperture, said piston being in sealingly slidable contact with the inner surfaces of said housing to form at least a partial vacuum in said housing behind said aperture, and a pivoted lever arm pivotally connected to said piston and said housing, said lever arm when

pivoted will cause said piston to move in said housing to form said vacuum therein.

4,103,889
COLLAPSIBLE BAG FOR IMPACT ABSORBING ACTIVITIES AND METHOD OF MAKING
Terry J. Lobur, 1914 Walbrook Ave., Cleveland, Ohio 44109
Filed Apr. 5, 1976, Ser. No. 673,430
Int. Cl.[2] A63B *67/00, 69/00*
U.S. Cl. 272—77 **8 Claims**

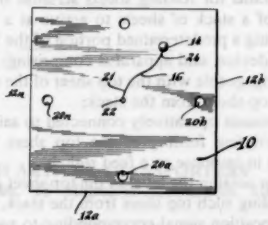


3. A collapsible bag for use in athletic impact absorbing activities, comprising:
(a) a flexible casing,
(b) a collapsible and inflatable envelope disposed within said casing, the envelope being adapted to be inflated to expand said envelope within said casing,
(c) a recess defined by said envelope;
(d) a quantity of generally granular weighting material removably contained within the recess;
(e) access means for providing access through said casing to said recess to enable selective addition or removal of weighting material to or from said recess to thereby impart a selected weight to said bag; and,
(f) said envelope being inflated when in use to envelope and retain the weighting material in place.

4,103,890
GAME
Robert J. Treasarden, Lake Errock, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Dec. 8, 1977, Ser. No. 858,692
Int. Cl.[2] A63F *9/00*
U.S. Cl. 273—1 E **2 Claims**

1. A game, comprising
a box having an alarm plug tube of electrically insulative material has electrical contacts in spaced relation;
an alarm circuit in the box electrically connected to the electrical contacts for indicating when the electrical contacts in the alarm plug tube are in electrical connection, said alarm circuit having a battery, lamps and an audible alarm connected to the electrical contacts;
an alarm plug of electrically insulative material having raised electrically conductive contact projections extending from the surface thereof in spaced random relation whereby a player attempts to withdraw the alarm plug from the alarm plug tube without electrically connecting the electrical contacts of said alarm plug tube via the contact projections of said alarm plug;
a switch in the box; and
a timer in the box electrically connected in circuit with the switch, the audible alarm and the battery for determining a period of time during which a player attempts to remove the alarm plug from the alarm plug tube, said switch neutralizing the timer and the audible alarm when opened.

4,103,891
GAME DEVICES
Patrick L. Stefano, Cleveland, Ohio, assignor to Stanley M. Miska, Sr., Weston, Conn.
Filed Feb. 4, 1977, Ser. No. 765,598
Int. Cl.[2] A63B *67/10*
U.S. Cl. 273—97 R **14 Claims**



1. A game device comprising
a sheet-like playing surface made from supple, wrinklable, snappable, flexible material, for being grasped for manipulation by at least two players,
and a tether, one end of which is affixed to the mid-region of said surface, and to the other end of which is affixed a playing object,
said surface having at least two object receiver areas positioned in the edge region of said surface with their respective mid-points substantially equidistant from the point of affixation of said tether to said surface, each of which areas comprises one or more holes in said surface into which said object will fit, the outermost of which holes have their centers at a distance from said point not greater than the length of said tether plus the distance from the center of said object to its point of affixation to said tether, the angular displacement of the mid-points of said areas with respect to each other being substantially $360°/n$ where "n" is the number of said areas,
whereby players grasping edges of said surface may manipulate said surface to cause relative motion between said playing object and one or more of said holes.

4,103,892
LIGHT ACTUATED TARGET CONTROL FOR AN AMUSEMENT DEVICE
George B. Hinze, Westminster, Calif., assignor to Walt Disney Productions, Burbank, Calif.
Filed May 19, 1977, Ser. No. 798,606
Int. Cl.[2] F41J *5/02, 9/00*
U.S. Cl. 273—101.1 **10 Claims**

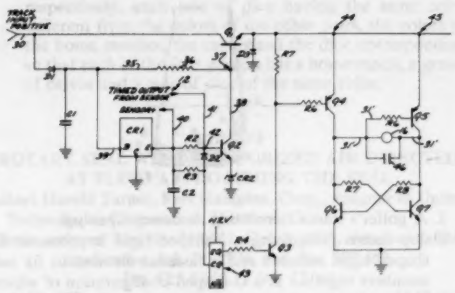
1. A reaction circuit for an amusement device in which means for providing a beam of energy is directed at a target constrained to move along a predetermined path comprising:
(a) a direct current electrical motor driving said target in a first direction along said path;
(b) an electrical power supply connected to said motor for supplying direct electrical current thereto through driv-

ing transistor means when said driving transistor means is biased to a conducting state below saturation;

(c) a bias connection from an electrical voltage supply to bias said driving transistor means into a conducting state;

(d) voltage clamping circuitry connected to said bias connection and including a normally conductive semiconductor element through which current is drained when voltage in said bias connection exceeds a preselected steady state bias level to thereby maintain a bias voltage;

(e) a shunt circuit connected to a direct current supply to normally bias said semiconductor element into a conducting state;



(f) a ground connection from said shunt circuit including a normally non-conductive circuit element actuable to a conductive state by a beam of energy directed thereat;

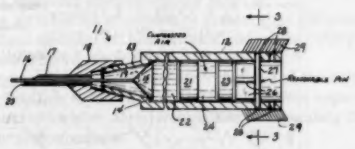
whereby actuation of said normally non-conductive circuit element by a beam of energy completes said ground connection to drop the bias from said semiconductor element in said shunt circuit to temporarily disable said bias voltage and increase the bias on said driving transistor means, thereby increasing power to said motor to accelerate said target along said path.

4,103,893

TRANQUILIZER DART

Elijah C. Walker, Takoma Park, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Jun. 10, 1977, Ser. No. 805,567
Int. Cl.[2] A61D *7/00*
U.S. Cl. 273—106.5 D **10 Claims**



1. A lightweight projectile dart for injecting liquid into an animal upon impact, comprising:

a barrel having a forward end and a rearward end and being provided at said forward end with a hollow needle,

means defining a valve seat in the barrel near said forward end,

a valve element sealingly engageable with said seat and movable toward said rearward end to unseat

a triggering pin connected to said valve element and extending through said needle and projecting forwardly therefrom when the valve element engages the seat,

first movable plunger means in the barrel spaced rearwardly from said valve element and defining a liquid reservoir relative to said valve element,

second movable plunger means in the barrel spaced rearwardly from said first movable plunger means defining an air space relative to said first plunger means, and

stop means in the barrel located rearwardly of said second movable plunger means and holding the second movable plunger means in a pressurizing position for compressing the air in said air space,

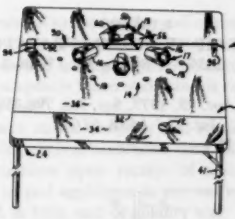
whereby the compressed air acts on the first plunger means to force liquid in said reservoir past the valve element when the valve element is unseated by impact of the triggering pin with an animal, said valve seat being communicatively connected with said hollow needle.

4,103,894

DISK ROLLING GAME OF VARIABLE DIFFICULTY

Dan McCraw, Hot Springs, Ark., assignor to Domination Incorporated, Hot Springs, Ark.

Filed May 26, 1977, Ser. No. 800,806
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—126 A **18 Claims**



1. An amusement game adapted to be played by one or more players, said game comprising:

a plurality of disk-like magnetically attachable game pieces:

a fortress adapted to be disposed upon a supporting surface, said fortress comprising:

a base portion;

a substantially planar safe area in which pieces may be received;

a wall extending around said safe area and above said base; and

a plurality of nubs disposed at radially spaced apart locations on at least a portion of said wall and the edge of said safe area for impeding passage of pieces between said wall and into said safe area;

a plurality of cup-like traps for impeding passage of said game pieces which contact same, said traps comprising a mouth portion substantially larger than said game pieces whereby said game pieces may be admitted into said traps; and

a plurality of magnetic parasites for altering the course of said game pieces travelling in close proximity thereto.

4,103,895

CONCEALED PATTERN DETECTION GAME

Gerald L. Pressman, 7925 Rainbow Dr., Cupertino, Calif. 95014, and Louis Wilk, 12440 Hilltop Dr., Los Altos Hills, Calif. 94022

Filed Mar. 19, 1976, Ser. No. 668,376
Int. Cl.[2] A63F *9/06*
U.S. Cl. 273—153 R **13 Claims**

1. A game or test of skill comprising:

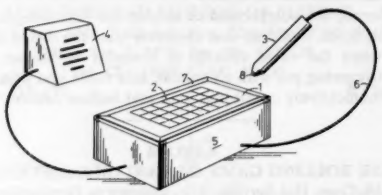
a playing surface concealing a pattern of paths;

a means for selecting areas or points on said playing surface;

electronic circuit means connected to said selecting means and said pattern of paths, wherein said selecting means and said pattern of paths, during said selection of areas or points, comprise electronic circuit coupling for said electronic circuit means, and said circuit coupling is effected

by electromagnetic fields between said selecting means and said pattern of paths; and

an indicator means, activated by said electronic circuit means in response to said electronic circuit coupling, for



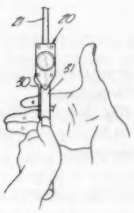
revealing whether the selected point on said surface corresponds to a point on said pattern of paths; in which the object of the game is to discover properties of the concealed pattern.

4,103,896

GOLF GRIP TRAINING APPARATUS

Walter R. Lorang, 2239 W. Maple Rd., Walled Lake, Mich. 48088

Filed Apr. 25, 1977, Ser. No. 790,258
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—183 D **8 Claims**



1. Golf-grip training apparatus in combination with a golf club having a shaft, a hand-grip portion on said shaft, a head on said shaft, and a striking face on said head;

said striking face defining the target side of said shaft, said head, said hand-grip portion, and said striking face;

said apparatus comprising

signal means, and

force sensitive means connected to said signal means to cause said signal means to emit a signal upon more than minimal force being imposed on said force sensitive means;

said signal means being mounted on said shaft of said golf club and said force sensitive means being mounted on said target side of said hand grip portion of said golf club;

said force sensitive means being positioned on the target side of said hand-grip portion of said golf club when held in the address position so as to be in alignment with said striking face relative to the target;

said force sensitive means overlying said hand-grip portion of said golf club in the location of at least the tip joints of at least the middle two fingers of the golfer's off-target hand;

force in excess of minimal exerted by the fingers of the off-target hand on said force sensitive means in the golfer's grip on and in his swing of a golf club causing said force sensitive means to activate said signal means to emit a signal advising the golfer that his off-target hand has interfered with his swing;

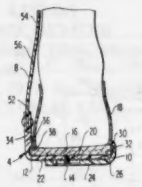
minimal force exerted by the fingers of the off-target hand on said force sensitive means in the grip and in the swing of a golf club not causing said force sensitive means to activate said signal means and the absence of a signal advising the golfer that his off-target hand has not interfered with his swing.

4,103,897

GOLFER'S STANCE CORRECTING DEVICE

Rene Ostyn, 810 S. 11th St., Fort Pierce, Fla. 33450

Filed Jun. 27, 1977, Ser. No. 810,320
Int. Cl.[2] A63B *69/36*; **A61F** *3/00*
U.S. Cl. 273—188 A **5 Claims**



1. A golfer's stance correcting device comprising:

clamp means comprising a J-shaped rigid member, an L-shaped rigid member and a fastener element to fix said members together in a U-shaped configuration of adjustable width for clamping across the shank of a golfer's shoe,

a flexible band for strapping about the lower leg of the golfer above the shoe carrying said clamp means,

a rigid strip member having upper and lower ends pivoted at its lower end to the free end a said L-shaped member for rocking movement substantially parallel to the longitudinal axis as said golfer's shoe, and

a pocket in said flexible band in which said upper end of said strip member is held.

4,103,898

BOARD GAME

Frank F. Fulton, Las Vegas, Nev., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed May 5, 1977, Ser. No. 794,109
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—248 **1 Claim**

1. A board game, comprising

a game board of square shape having a plurality of equally dimensioned squares thereon in rows and columns, said squares constituting five sets of 36 squares each, each set having the same indications as the others, but in different locations on the board, each set having 36 different cattle brands each in a corresponding one of its squares, four

corner squares larger than each of the plurality of squares, each of the corner squares being identified as the home ranch of a specific color different from the colors of the other home ranches, four START squares of the same dimensions as the plurality of squares, each of said START squares being next adjacent a corresponding one of the corner squares, five MAVERICK squares of the same dimensions as the plurality of squares in different locations on the board;

four groups of miniature plastic calves, each group having a plurality of calves of the same color different from the colors of other groups; and

four pairs of dice, each die having six surfaces, two blank and the remaining four having 1, 2, 3 and 4 dots thereon, respectively, each pair of dice having the same color different from the colors of the other pairs, the colors of the home ranches, the calves and the dice corresponding so that each of the four players has a home ranch, a group of calves and a pair of dice of the same color.

4,103,899

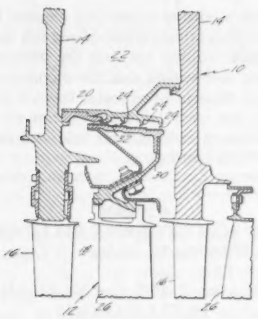
ROTARY SEAL WITH PRESSURIZED AIR DIRECTED AT FLUID APPROACHING THE SEAL

Albert Harold Turner, East Hampton, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 618,541, Oct. 1, 1975, abandoned. This application Jul. 28, 1976, Ser. No. 709,463

Int. Cl.[2] F16J *15/40, 15/44*

U.S. Cl. 277—1 **12 Claims**



7. A method for reducing the leakage of a fluid medium across a rotary seal between two relatively rotating components of a machine, comprising the steps of:

flowing air which is at a pressure greater than the pressure of the fluid medium at the upstream end of the rotary seal to the seal region; and

discharging the air across the upstream end of the rotary seal in opposition to the flow of the fluid medium approaching the seal to form an aerodynamic barrier impeding the flow of the fluid medium.

4,103,900

ORIGINALITY SEAL FOR DISPOSABLE RECEPTACLES

Adam Wittersheim, Nieder-Ramstadt-Trautheim, Fed. Rep. of Germany, assignor to Goldwell GmbH Chemische Fabrik H.E. Dotter, Darmstadt-Eberstadt, Fed. Rep. of Germany

Filed Aug. 30, 1976, Ser. No. 718,698

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1975, 2539838

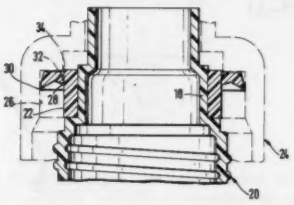
Int. Cl.[2] B65B *7/28;* **B65D** *41/32*

U.S. Cl. 277—2 **8 Claims**

1. An originality seal for a disposable, non-reusable receptacle having a spout receivable within an opening of an applicator, which applicator has a wall extending peripherally about, and outwardly from the opening therein, comprising:

sealing means associated with said spout of said receptacle, said sealing means including a peripheral wall sealing surface disposable about said spout which opposes and is spaced from the interior peripheral surface of said applicator wall when said spout is received in said opening of said applicator;

a resilient sealing ring receivable on said spout adjacent to said peripheral sealing surface associated therewith, said ring having at least two sealing lips, one of which is disposed for cooperative sealing engagement with the interior peripheral surface of the wall of the applicator and the other of which is disposed for cooperative sealing engagement with said sealing surface associated with said spout of said receptacle when said spout is received within said opening; and



frangible web means coupling said resilient sealing ring to said sealing surface associated with said receptacle spout which ruptures upon receipt of said spout within the opening of said applicator to prevent reuse of said sealing ring and, in turn, said originality seal.

4,103,901

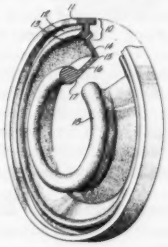
MOLDED PLEATED GASKET AND DEVICE FOR INSTALLING SAME ON PIPE

John Ditcher, Langhorne, Pa., assignor to A-Lok Corporation, Trenton, N.J.

Filed Dec. 27, 1976, Ser. No. 754,109

Int. Cl.[2] F16J *15/10;* **B23P** *19/00*

U.S. Cl. 277—9.5 **9 Claims**



1. A molded elastomeric gasket for resiliently supporting a sewer pipe in a manhole opening and sealing the space between the wall of the opening and the surface of the pipe, said gasket having an outer cylindrical flange member extending axially on both sides of a mid-plane which is normal to the axis of the pipe; a first web of substantial thickness extending radially inwardly from a mid-region of the inner surface of said cylindrical flange member and integral therewith, said web and said flange being adapted for embedment in settable material lining the manhole opening; an intermediate web, integral with said first web and extending at an obtuse angle radially inwardly from the mid-plane and at its inner edge being united with a third web, which extends from the juncture line at a reverse angle towards the pipe, said third web terminating in a rim portion of toroidal form, integral with said web and having an

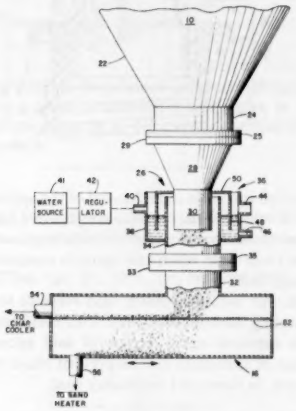
inner diameter substantially less than the outer diameter of said pipe.

4,103,902

WATER SEAL FOR REGENERATOR

Peter Steiner, Edison, and William Frederick Bischoff, Califon, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Aug. 16, 1977, Ser. No. 825,122
Int. Cl.[2] B01J *8/08;* **F16J** *15/40*
U.S. Cl. 277—12 **4 Claims**



1. In combination with a regeneration vessel for the thermal regeneration of an adsorbent material, means for introducing the saturated adsorbent material from an adsorption source into the vessel, means for introducing into the vessel a heated, inert material from a second source, a discharge means disposed adjacent to the exit portion of said vessel, and a vibratory separator means disposed adjacent to said discharge means for receiving the mixture of adsorbent and inert materials passing from said discharge means and for separating said materials, a device for establishing a fluid seal between said discharge means and said vibratory separator means which comprises:

a fluid container having a fluid therein and attached to and movable with said vibratory separator means;

sealing means having an open end portion and a closed end portion and supported upon said discharge means with said open end portion extending below the level of the fluid in said container, such that a hydrostatic seal is established within the enclosed volume defined by the internal volume of said sealing means and the surface of the fluid; and

conduit means interconnecting said discharge means and said separator means to provide an unobstructed flow path for said materials.

4,103,903

FLUID ACTUATED SEALING ARRANGEMENT

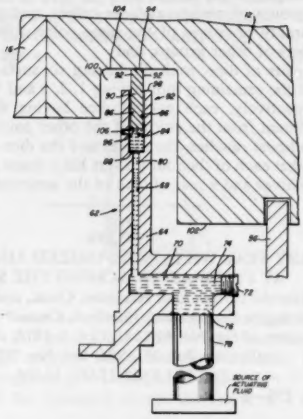
Alfred J. Capriotti, Falls Township, Bucks County; John Gana, Buckingham Borough, and Thomas J. Korpela, Upper Merion Township, Montgomery County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Jul. 29, 1976, Ser. No. 709,732
Int. Cl.[2] F16J *15/16;* **F16L** *17/00*
U.S. Cl. 277—27 **24 Claims**

1. A fluid actuated sealing arrangement adapted to provide a seal for an element to be sealed, said fluid actuated sealing arrangement comprising:

a housing, said housing having a means defining a bore extending therethrough through which an actuating fluid, from a source, may be passed from an entrance end of said housing to a sealing end of said housing and means defining a slot at said sealing end of said housing connected to said bore and being configured having a sealing seat therein; and

a seal element, adapted to fit within said slot, said seal element being movable by such actuating fluid away from said sealing seat into sealing association with such element



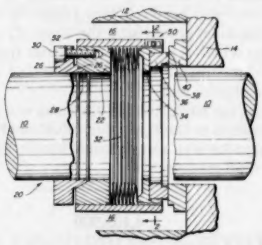
to be sealed, a portion of said seal element being extendable from without the confines of said slot thereby leaving a fluid fillable volume between the bottom of said seal element and said sealing seat for accommodating movement of said element to be sealed toward and away from said sealing seat, such fluid being operative to both actuate said seal element and lubricate said seal element within said slot of said housing.

4,103,904

ELASTIC POSITIVE DRIVE BELLOWS SEAL

Harry Tankus, Wilmette, Ill., assignor to Crane Packing Co., Morton Grove, Ill.

Filed Sep. 7, 1977, Ser. No. 831,331
Int. Cl.[2] F16J *15/36*
U.S. Cl. 277—42 **7 Claims**



1. An elastic positive drive mechanical bellows seal for sealing a space between a housing and a rotating shaft extending therethrough, said seal comprising:

(a) an annular collar support means mounted coaxially upon said shaft and in sealing engagement with said shaft;

(b) an annular bellows section carried by said support means extending coaxial of said shaft and having a first sealing element mounted on an end opposite said support means, said sealing element having a first radially extending sealing face;

(c) a sealing element carried by said housing coaxial of said

shaft, and having a second radially extending sealing face positioned in mating relating to said first face;

(d) resilient means for interconnecting said support means and said first sealing element to minimize torsional forces imposed on said bellows, said means including a biasing means whose force is directed circumferentially of said bellows;

(e) said resilient means including a tubular member constrained for rotation with said collar means and extending coaxial of said shaft towards said washer; a detent means affixed to said washer; and compression springs interposed between said tubular member and said detent means.

4,103,905

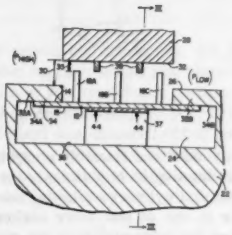
VARIABLE RADIUS SPRINGBACK WAVY SEAL

John W. Desmond, Media; Joseph F. Kmec, Aston, and Charles A. Meyer, Media, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 665,346, Mar. 9, 1976, abandoned. This application Feb. 7, 1977, Ser. No. 766,475

Int. Cl.[2] **F16J** *15/48;* **F01D** *5/20*

U.S. Cl. 277—56 **11 Claims**



1. In combination a seal arrangement, a rotatable member, and a stationary member spacially separated from and disposed about said rotatable member, one of said members having a circumferential groove therein, said seal arrangement comprising:

a thin strip having generally parallel major surfaces an at least one undulating ribbon mounted in an edgewise manner along its length on one of said major surfaces so that the undulating ribbon and its undulations are generally perpendicular to the attached major surface, said strip being conformable to and receivable in said groove, the ends of said strip and attached ribbon being disposed in closely spaced, circumferentially adjacent relationship.

4,103,906

ROTARY SEAL WITH RESILIENT DIAPHRAGM

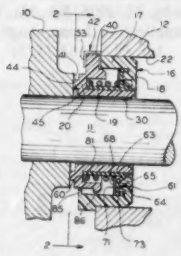
Norbert W. Gits, 6417 Blackhawk Trail, Indian Head Park, Ill. 60525

Filed Nov. 11, 1977, Ser. No. 850,542

Int. Cl.[2] **F16J** *15/34*

U.S. Cl. 277—88 **11 Claims**

1. In a rotary seal for use between a fixed part (**10**) and a shaft (**11**) rotating relative to the fixed part (**12**), the fixed part (**10**) and shaft (**11**) each having a pad(**41, 44**) in face-to-face rubbing contact, an annular member (**16**) surrounding the shaft (**11**) and means to prevent rotation of the member (**16**) relative to the fixed part (**10**), the improvement which comprises means constituting a liquidtight seal between the fixed and rotatable parts (**10, 11**), said member (**16**) and annular member (**20**) having respective male and female loosely-interengaged elements (**16, 14**) for joint coupling thereof, the annular member (**20**) and the member (**16**) having interior cavities together defining a chamber to house a diaphragm (**61**) sealing the chamber against leakage of the medium being sealed, and a compression spring (**81**) biasing the rotatable seal pad (**41**) into rubbing contact with the fixed part (**12**), the part (**10**) having an annular hub (**19**) extending along substantially the whole axial length of the seal assembly, the diaphragm (**61**) being of sleeve-like form terminating at one end in an integral bead (**65**) of substantially U-shaped transverse cross section deformable both axially and radially in response to forces applied radially



and axially to the diaphragm, the compression spring (**81**) being inerposed between respective shoulders at respective ends of the diaphragm to bias the pads (**41, 44**) together in rubbing abutment.

4,103,907

MECHANICAL SEAL

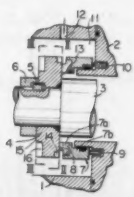
Hiroshi Inouye, Ibaraki, and Sadao Kobayashi, Takarazuka, both of Japan, assignors to Hitachi, Ltd. and Nippon Pillar Packing Co., Ltd., both of, Japan

Filed Jun. 7, 1976, Ser. No. 693,314

Claims priority, application Japan, Jun. 9, 1975, 50-68605

Int. Cl.[2] **F16J** *15/34*

U.S. Cl. 277—96.1 **23 Claims**



1. A mechanical seal suitable for shaft sealing under the conditions of high pressure, high temperature and high speed, comprising:

a shaft;

a rotatable sealing element mounted on a shaft and rotated along with said shaft;

a stationary sealing element forming a sliding seal surface where sealing action is performed in cooperation with said rotatable sealing element;

spring means provided in the axial direction to increase the surface pressure of said sliding seal surface;

a plurality of surface deformation generating groove means for generating surface deformations at the sliding seal surface with thermal expansion to thereby create a film of cooling fluid therein, said surface deformation generating groove means extending radially and being spaced apart in the circumferential direction thereof in portions close to but not in contact with the sliding seal surface on the side of the sliding seal surface of at least one of the sealing elements.

4,103,908

SEAL STRUCTURES FOR ROTARY REGENERATIVE HEAT EXCHANGERS OF GAS TURBINE ENGINES

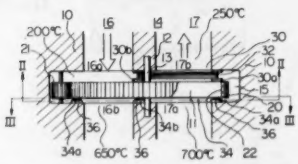
Osamu Kobayashi, Yokohama; Ikuo Nakamura, and Akira Shimozono, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Aug. 12, 1976, Ser. No. 713,963

Claims priority, application Japan, Aug. 26, 1975, 50-103281

Int. Cl.[2] F16J *15/34*

U.S. Cl. 277—96.2 **2 Claims**



1. In a gas turbine engine, a rubbing seal for engagement with a hot face of a matrix of a rotary regenerative heat exchanger, comprising an annular portion made from carbon block, a diametrical portion having a rubbing contact surface made of a compound of nickel and calcium fluoride, and a layer of a compound of nickel oxide and calcium fluoride formed on an inner circumferential wall of the annular portion.

4,103,909

SEAL FOR A DRIVE JOURNAL OF A BALL VALVE

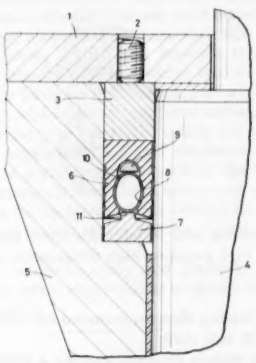
Michael Hoffman, and Rolf Pape, both of Berlin, Fed. Rep. of Germany, assignors to Borsig Gesellschaft mit beschrankter Haftung, Berlin, Fed. Rep. of Germany

Filed Sep. 29, 1977, Ser. No. 837,523

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644419

Int. Cl.[2] F16J *15/24*; F16K *31/44*

U.S. Cl. 277—101 **3 Claims**



1. A seal for a drive journal of a ball valve, which comprises:
a housing which accommodates said drive journal;
a cover, located on said housing, through which a portion of said drive journal juts;
an annular thrust collar located in said housing adjacent said drive journal and directed against said cover;
a plurality of set screws located in said cover and adapted to displace said thrust collar in the axial direction of said drive journal;
a U-ring which acts as a sealing ring and which abuts the thrust collar and is located between said drive journal and said housing, said U-ring being provided with an annular slot which is open toward that end of said U-ring which is remote from said thrust collar;
a thrust ring located in said housing at the open end of said slot;
a metallic compensating ring located in the deepest portion of said slot; and
an annular spiral spring located in said slot between said compensating ring and said thrust ring.

4,103,910

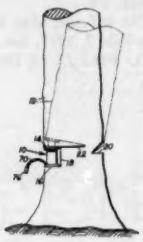
PISTON-CYLINDER SEAL ASSEMBLY

Elmer R. Silvey, 1231 Dutton Rd., Eagle Point, Oreg. 97524

Division of Ser. No. 621,757, Oct. 14, 1975, Pat. No. 4,026,524. This application May 5, 1977, Ser. No. 793,839

Int. Cl.[2] F16J *15/18*; A01G *23/08*

U.S. Cl. 277—165 **3 Claims**



1. A piston-cylinder seal assembly comprising
(a) a cylinder housing having an inner surface,
(b) a piston in said cylinder having an outer surface,
(c) a groove in one of said inner surface of the cylinder housing and the outer surface of the piston,
(d) said groove having an inner wall surface and opposed end wall surfaces,
(e) a resilient pressure sealing ring in said groove,
(f) said sealing ring having opposite surface portions one of which has engagement with one of said end wall surfaces of said groove,
(g) a resilient ring in said groove having inner and outer edges and having surface engagement between the other surface of said sealing ring and the other of said end wall surfaces of the groove,
(h) and a semi-resilient ring in said groove having inner and outer edges and also being in surface engagement between the said other surface of said sealing ring and the other of said end wall surfaces,
(i) the inner edge of said semi-resilient ring having edge engagement with the outer edge of said resilient ring and the outer edge of said semi-resilient ring having edge engagement with one of said housing and piston, whereby upon the application of surface pressure by the sealing ring against said resilient ring as a result of fluid pressure in the cylinder, said resilient ring is compressed and expands to a larger diameter which in turn expands said semi-resilient ring to a larger diameter as pressure expands said cylinder, thus preventing failure of said pressure seal.

4,103,911

SEALING MEMBER FOR CABLE INLETS

Wolfgang Giebel, and Herbert Krause, Both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation-in-part of Ser. No. 584,522, Jun. 6, 1975, abandoned. This application Apr. 1, 1977, Ser. No. 783,752

Int. Cl.[2] H02G *15/24, 15/18*

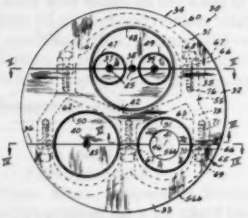
U.S. Cl. 277—210 **11 Claims**

1. An annular sealing member having an axis and comprising:
at least two rigid, spaced-apart disk portions each coaxial

with and extending transversely of said axis of the sealing member;

a rigid reinforcing portion extending between said disk members, having a continuous annular periphery about said axis, and being apertured through at least one central portion;

the disk portions and reinforcing portion together being divided into at least two separate sealing member portions on a plane extending substantially parallel to said axis of the sealing member and through the central portion of the reinforcing portion; and



bolt means for selectively connecting the portions of the sealing member together across said plane and about said central portion of said reinforcing portion,

whereby the sealing member may be bored through at said plane to form a desired semi-circular, ribbed recess in each of said sealing member portions, the sealing member portions being clampable about a cable to form a gas-tight seal along said cable at a cable inlet fitting into which the seal member and cable are inserted.

4,103,912

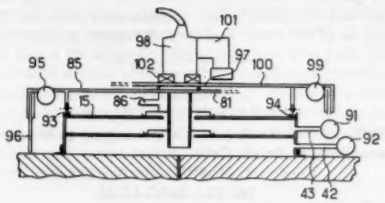
MOVING SEALING JUNCTION WITH SEALING STRIPS CONTROLLED BY MECHANICAL OPERATORS

Paul Thomé, 8 rue Coutureau, 92210 Saint-Cloud, France

Filed Aug. 30, 1976, Ser. No. 718,822

Int. Cl.[2] B23K *15/00;* **F16J** *15/32*

U.S. Cl. 277—226 **10 Claims**



1. A movable sealing device of the type comprising a chamber movable along a pre-determined path along a wall with which it is tightly connected on a closed contour, and means for providing an opening through the wall within said contour and for causing said opening to progress along the pre-determined path of the chamber simultaneously with the latter, wherein said device comprises, along the mobile chamber path, at least one row of mechanically resistant members removable from a supporting position to a non-supporting position while the chamber is passing, and at least one uninterrupted sealing strip, at least partly supported by said members when they are in the supporting position, and resiliently deformable for forming said opening at those places where said members are removed.

4,103,913

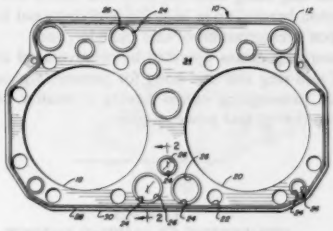
FRETTING CORROSION RESISTANT GASKET AND METHOD OF MAKING SAME

Donald J. McDowell, Riverside, Ill., assignor to Felt Products Mfg. Co., Skokie, Ill.

Filed Apr. 19, 1976, Ser. No. 678,043

Int. Cl.[2] F16J *15/10*

U.S. Cl. 277—235 B **3 Claims**



1. A fretting corrosion resistant gasket assembly adapted to be positioned between an engine block and head, comprising:

a steel gasket body having first and second generally planar surfaces defining a plurality of piston-size apertures and a plurality of fluid flow passageways, and at least one of said surfaces having a roughened surface and being coated with a substantial uniform layer of a mixture of molybdenum disulfide and polytetrafluoroethylene in a ratio of from about 35 percent to about 65 percent molybdenum disulfide and from about 65 percent to about 35 percent polytetrafluoroethylene by weight, and wherein said layer is from about 0.0005 to about 0.001 inch thick, and wherein said layer serves to enhance resistance to fretting corrosion.

4,103,914

DRILL CHUCK

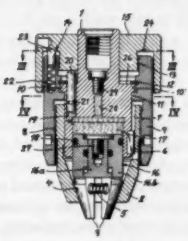
Günter Horst Röhm, Heinrich-Rohm-Str. 50, Sontheim, Fed. Rep. of Germany (7927)

Filed Aug. 11, 1977, Ser. No. 823,868

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1976, 2639214

Int. Cl.[2] B23B *31/12*

U.S. Cl. 279—4 **10 Claims**



1. A drill chuck comprising:

a chuck body having an axis and adapted to be fixed to a drilling machine spindle;

a tightening cone mounted on said body for displacement axially relative thereto but angularly fixed on said body;

a plurality of chuck jaws radially displaceable by said cone and axially aligned with said body;

a tightening sleeve rotatable on said body but axially fixed relatively thereto and threadedly engaging said cone for axially displacing same upon angular displacement of said sleeve;

a tightening ring rotatable and axially shiftable on said body;

a torque-responsive clutch between said sleeve and said ring effective to couple said sleeve to said ring for joint angular displacement below a predetermined torque and to allow rotation of said ring relative to said sleeve upon the application of a torque above said predetermined torque to said ring;

a power piston axially displaceable in said body, said body forming a power cylinder receiving said power piston, said ring being threaded onto said sleeve and said power piston bearing upon jaws for applying axial force thereto upon pressurization of said cylinder; and

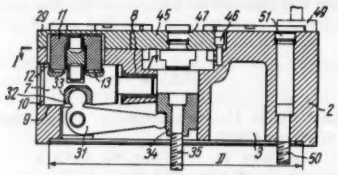
pressurizing means operated by relative axial displacement of said ring and said body for pressurizing said cylinder, said pressurizing means having a smaller cross section than that of said power piston.

4,103,915

CENTERING CLAMPING DEVICE

Mikhail Romanovich Zdanovsky, ulitsa Chernyakhovskogo, 4a, kv. 50; Viktor Vasilievich Minashin, ulitsa Shukhova, 5/7, kv. 58; Vladimir Yakovlevich Nikolaev, Yaltinskaya ulitsa, 12, kv. 17; Viktor Alexandrovich Razuvaev, Varshavskoe shosse, 3, linia, 12, kv. 13; Ivan Petrovich Perelygin, Avtozavodskaya ulitsa, 17, korpus 1, kv. 15; Stanislav Leonidovich Mikhaevich, ulitsa Chernyakhovskogo, 9, korpus 3, kv. 286, and Lev Samuilovich Dridze, ulitsa Guryanova, 3, kv. 41, all of, Moscow, U.S.S.R.

Filed Dec. 7, 1976, Ser. No. 748,365
Int. Cl.[2] B23B *31/16*
U.S. Cl. 279—119 **9 Claims**



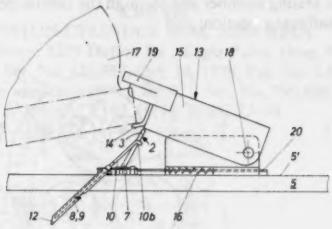
1. A centering clamping device comprising: a housing; means defining guideways radially arranged in said housing from the periphery toward the center thereof; paired clamping jaws accommodated in said guideways for reciprocation therealong toward and away from the center of said housing to position a workpiece at the center of said housing of the clamping device and to retain said workpiece in a centered position; driving trains in a number corresponding to the number of pairs of said clamping jaws, each said driving train operatively interconnecting two adjacent ones of said clamping jaws, in at least three groups of symmetrically arranged pairs of said clamping jaws; a drive common to all said pairs of the jaws for displacement thereof toward and away from the center of said housing; each said driving train including a member operatively connected to said drive and mounted for reciprocation along a bisector of an angle defined by the guideways of each respective pair of said clamping jaws, each said member carrying thereon a freely rotatable element having an axis of rotation situated on said bisector of the angle between the respective clamping jaws of a pair, means connecting each said element with each one of said clamping jaws of the respective one of said pairs so that when one of said clamping jaws of said pair contacts the workpiece, the other said clamping jaw of said pair is moved into engagement with the workpiece, whereby all said pairs of said clamping jaws simultaneously displace the workpiece with efforts directed substantially toward the center of said housing.

4,103,916

BRAKE DEVICE FOR SKIS

Erwin Krob, Vienna; Erwin Weigl, Brunn am Gebirge, and Josef Svoboda, Schwachat, all of Austria, assignors to TMC Corporation, Baar, Zug, Switzerland

Filed Nov. 24, 1976, Ser. No. 744,940
Claims priority, application Austria, Nov. 25, 1975, 8939/75
Int. Cl.[2] A63C *7/10*
U.S. Cl. 280—605 **7 Claims**



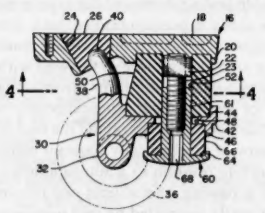
1. In a ski brake for a ski including a brake member having a pair of brake legs, said brake member being pivotally supported on said ski for movement between a ready position and a braking position and which can be moved under spring action automatically into said braking position and in this position said brake legs project downwardly over said ski, each brake leg being constructed with two extensions wherein a first extension includes a part projecting under a holding plate secured to said ski and thereafter is attached to a step-on member and wherein a second extension is directly engaged with said step-on member, wherein at least said first extension consists of spring steel wire and said part which projects under said holding plate serves as a bearing, the improvement comprising a heel holder and support means for supporting said heel holder for movement on said ski in a direction parallel to the longitudinal axis of said ski, wherein said spring steel wire is approximately U-shaped having a pair of legs and a cross-part interconnecting said legs, wherein said U-shaped spring steel wire forms said step-on member, wherein said second extension extends beneath the associated one of said two legs of said U-shaped spring steel wire, and wherein a projection is provided on said heel holder, said projection engaging said step-on member to effect a lifting of said brake legs into said ready position above the ski surface by closing said heel holder and to further effect simultaneous with the closing a pulling in of the brake legs over the upper surface of the ski.

4,103,917

SKATEBOARD TRUCK

Philip R. Widolf, Santa Ana, Calif., assignor to Woody-Widolf, Inc., Newport Beach, Calif.

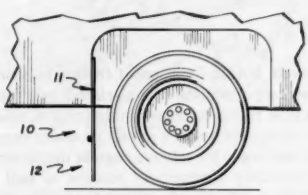
Filed Oct. 26, 1976, Ser. No. 735,651
Int. Cl.[2] A63C *17/02*
U.S. Cl. 280—11.28 **15 Claims**



1. A truck for a skateboard or the like having a platform comprising:

a support base adapted to be mounted to the under side of the platform;
threaded means on said base;
a wheel support housing;
a resilient cushion having walls defining a bore therethrough extending between the housing and said base; and
an elongated threaded retainer having a shank extending through a hole in said housing and into said cushion bore, said retainer shank having a threaded portion threaded to said base threaded means to compress said cushion and thereby resiliently mount the housing on the base, said retainer shank having an exterior portion with means thereon which mate with means on the walls of said cushion bore to prevent rotation of said retainer relative to said cushion during use of said truck, although the resiliency of said cushion permits manual forceable rotation of the retainer relative to the cushion for adjusting compression on the cushion.

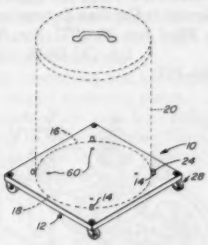
4,103,918
FENDER FLAP
Leroy Salden, St. Peter, Minn., assignor to Winden Tool & Stamping, Inc., St. Peter, Minn.
Filed May 19, 1977, Ser. No. 798,657
Int. Cl. B62d *25/16*
U.S. Cl. 280—154.5 R **3 Claims**



1. A fender flap for the deflection of road materials consisting of:
a. a first, generally rectangular plate member arranged for attachment to a vehicle;
b. a second, generally rectangular plate member arranged for attachment to said first plate member to be in depending relation thereto;
c. means for hingedly connecting said first plate member to said second plate member; and,
d. said means for hingedly connecting said first plate member to said second plate member including a plurality of spaced, aligneable, pivot receiving members arranged along respective edges thereof, said pivot receiving members defining a generally rectangular interior configuration and said means including a connecting member of a generally circular configuration.

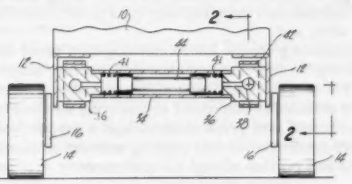
4,103,919
LOAD CARRYING DOLLY WITH SECURED POST CASTERS
Robert R. Greenheck, 3053 S. Ivory Ct., Aurora, Colo. 80013
Filed Jun. 6, 1977, Ser. No. 803,475
Int. Cl. B62D *53/06*
U.S. Cl. 280—79.1 A **9 Claims**

1. A load carrying dolly comprising:
a thin generally planar base provided with a first series of apertures passing therethrough and arranged in spaced relation around and slightly outward of a peripheral path corresponding to the planform of the base of a receptacle to be carried by the dolly;
a guiding post passing through each aperture and extending above the surface of the base to guide a selected receptacle into a predetermined position on the base;
a second series of apertures passing through the base and spaced outwardly of the first series;
a tubular caster socket extending upward through each aperture of the second series to a level substantially above the upper surface of the base;



a caster post provided with a caster at its lower end and extending upward through each socket;
and securing means connected to the upper end of each caster post to retain the post in the socket without restricting rotation of the caster post and prevent inadvertent disengagement therefrom.

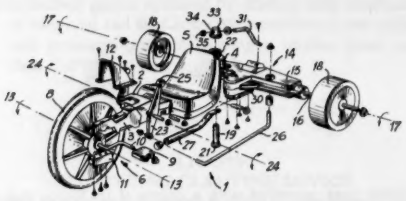
4,103,920
VEHICLE ANTI-ROLL MECHANISM
Roger R. Smith, 7261 Lyons Rd., Imlay City, Mich. 48444
Filed Mar. 21, 1977, Ser. No. 779,857
Int. Cl. B60G *21/06*
U.S. Cl. 280—112 A **2 Claims**



1. In a cargo-carrying road vehicle comprising a cargo body, roadwheels for the cargo body, and resilient suspension means operably connecting the cargo body to the roadwheels: the improvement comprising anti-roll means interposed between the cargo body and each resilient suspension means; said anti-roll means comprising a main hydraulic cylinder extending transversely across the undersurface of the cargo body, a main piston of appreciable mass slidably positioned within the cylinder for inertial movement in either direction from a normal position substantially equidistant from the cargo body sides, second and third auxiliary cylinders extending right angularly from the main cylinder at its opposite ends, second and third auxiliary pistons slidably disposed in respective ones of the auxiliary cylinders, force-transmitting hydraulic liquids filling the cylinders whereby movement of the main piston from its normal position in a given direction extends one auxiliary piston relative to its cylinder and retracts the other auxiliary piston relative to its cylinder; the main piston having sufficient mass so that when the vehicle is steered through a turn the resultant centrifugal force will move the main piston radially away from the turn axis, said main piston thereby causing the associated liquids to pressurize the auxiliary piston at the outer turn circumference and de-pressurize the auxiliary piston at the inner turn circumference; each resilient suspension comprising a first anchorage (**26**) operatively connected to a roadwheel, a second anchorage (**24**) operatively connected to an auxiliary piston, and a spring (**22**) trained between said anchorages, whereby extension or retraction of the auxiliary piston reposi-

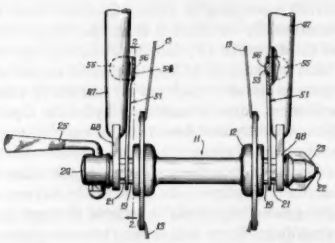
tions the associated anchorage (24) for thereby raising or lowering the adjacent portion of the cargo body.

4,103,921
REAR STEERING TOY WHEELED VEHICLE
Bertram Brooks, New York, N.Y., and Eugene Speed, Tarboro, N.C., assignors to Carolina Enterprises, Inc., New York, N.Y.
Filed Jun. 29, 1977, Ser. No. 811,245
Int. Cl.[2] B62K 9/00
U.S. Cl. 280—267 **17 Claims**



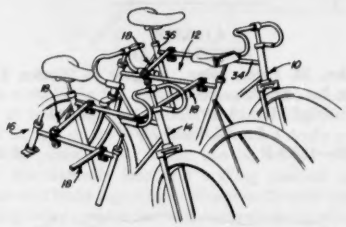
1. A vehicle, particularly a toy vehicle, comprising:
(a) an elongated body unit having opposite end regions;
(b) means at one of said end regions for propelling said body unit over a surface;
(c) means for steering said body unit over the surface during such propulsion, including
a steering unit located at the other of said end regions of said body unit;
(d) means for pivotally connecting said steering unit to said body unit for turning movement about an axis which extends transversely of the elongation of said body unit, including
a pivot element extending generally along said axis intermediate said units and forming a pivot connection therewith; and
(e) stabilizing means for reinforcing said pivot connection during turning movement of said steering unit about said pivot axis, said stabilizing means including a support member detachably connected to said body unit and to one end portion of said pivot element, and a support rod detachably connected to said steering unit and to another opposite end portion of said pivot element.

4,103,922
QUICK-RELEASE HUB RETENTION DEVICE
Frank P. Brilando, Niles, Ill., assignor to Schwinn Bicycle Company, Chicago, Ill.
Filed Oct. 28, 1976, Ser. No. 736,328
Int. Cl.[2] B62K 25/02
U.S. Cl. 280—279 **6 Claims**



1. A safety mounting for a bicycle quick-release hub having an axle engageable in open-ended slots in the lower ends of the legs of the front fork of the bicycle for receiving said axle, and a quick-release unit including adjustable retainer members movable relative to said axle longitudinally thereof for clampingly retaining said axle in said slots; comprising a pair of flexible retainer clips, each having a lower end mounted on said axle and an upper end with retainer means formed integrally therewith, and receiving means for cooperatively receiving a said retainer means and disposed on the laterally inner portion, and adjacent said lower end, of each of said front fork legs to prevent accidental separation of said hub from said fork despite release of said adjustable retainer members.

4,103,923
BICYCLE HOLDER
Marion V. Thomas, 545 Thornwood Dr., Baton Rouge, La. 70806
Filed Jan. 26, 1977, Ser. No. 765,760
Int. Cl.[2] B62H 5/00
U.S. Cl. 280—289 L **6 Claims**



1. A bicycle holder for support from a bicycle frame and locking and supporting the frame relative to a frame bar of a second bicycle frame or other similar object, said holder including an elongated brace, a mount pivotally supported from one end of said brace for relative angular displacement about a first axis extending transversely relative to said brace, said mount including structure for at least semi-permanent attachment to a frame bar of a first bicycle, an anchor, means pivotally supporting said anchor from the second end of said brace for relative angular displacement about a second axis extending transversely of said brace, said anchor including engaging means adapted to engage and to be locked against displacement away from an elongated member such as a frame bar of a second bicycle and to also releasably engage and be releasably supported from said frame bar of said first bicycle, said anchor including a split, generally cylindrical clamp having opposing generally semi-cylindrical spring jaws for releasable clamped engagement with a cylindrical member, said anchor including an integral finger-engageable eye member to facilitate manual withdrawal of said anchor from clamped engagement with a frame bar engaged thereby.

4,103,924
VEHICLE SAFETY DEVICE
Richard R. Suhm, 21380 Lorain Ave., Fairview Park, Ohio 44126
Filed Dec. 6, 1976, Ser. No. 747,715
Int. Cl.[2] B62J 5/00
U.S. Cl. 280—289 R **4 Claims**

1. A vehicle safety device adapted for detachable connection on a vehicle, such as a bicycle or the like, comprising
an elongated shaft member adapted to be detachably connected to said vehicle,
an elongated body member detachably mounted adjacent the opposite end of said shaft member,
the elongated portion of the body defining alternating convex and concave surfaces wherein a plurality of the convex surfaces blend at one end into an adjacent concave

surface and at the other end combine with a non-parallel concave surface to form blade-like terminal end edges,

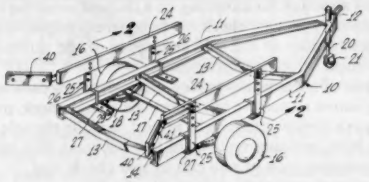
support means for rotatably mounting said body on said shaft member for rotational movement about the vertical axis of said shaft member.

4,103,925

GUIDE MEANS FOR BOAT TRAILER

Anthony P. Palamara, 7559 Calle Granada, Anaheim, Calif. 92807

Filed Jul. 30, 1976, Ser. No. 709,965
Int. Cl.[2] B60P 3/10
U.S. Cl. 280—414 A **6 Claims**



1. In a guide means for guiding a boat onto a wheeled trailer that has a boat carrying chassis including means adapted to support the hull of a boat in a longitudinally centered position thereon:

substantially parallel, horizontal side rails, one extending a substantial distance along each side of said chassis, adapted for sliding engagement by opposite sides of the hull of a boat entered longitudinally onto said chassis;

a pair of upright spring arms rigidly mounted at their lower ends on said chassis on each side thereof and being spaced a substantial distance along said side rails, the upper ends of said upright spring arms being supportingly fixed to said side rails, said upright spring arms being relatively stiff but resiliently deflectable outwardly of the chassis owing to impact by the side of a boat hull with a side rail supported thereby;

convergent auxiliary guide wings supported from said spring arms at the level of said rails and located as rearward extensions of said rails to guide a misaligned boat toward a centralized position relative to said chassis; and

means for yieldably mounting said wings on the rearward portions of said rails.

4,103,926

CONVERTIBLE BOAT-UTILITY TRAILER

Charles Richard Johnston, and James G. MacGregor, both of Wilmington, N.C., assignors to Consolidated Energy Products Co., Wilmington, N.C.

Filed May 9, 1977, Ser. No. 794,961
Int. Cl.[2] B60P 3/10
U.S. Cl. 280—414 R **9 Claims**

6. A convertible utility-boat trailer having a wheeled undercarriage and a telescoping tow bar including

(a) a utility carryall flat bed supported on said undercarriage,

(b) a series of keel rollers spaced along the centerline of said flat bed for supporting the hull of a boat thereon,

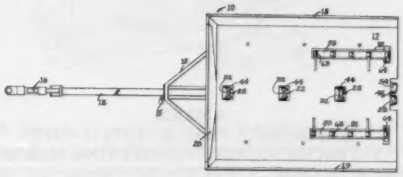
(c) mounting brackets for said keel rollers,

(d) openings formed along the centerline of said flat bed through which said keel roller brackets are adapted to be moved into and out of an elevated position with respect to the normal plane of said flat bed,

(e) fixed U-shaped mounting plates positioned in said openings beneath said flat bed with the side walls thereof providing toothed indexing quadrants,

(f) means for pivotally connecting said keel roller mounting brackets to said U-shaped mounting plates,

(g) indexing keys mounted on said keel roller mounting brackets and adapted to have releasable contact with said toothed indexing quadrants so as to releasably latch said keel roller mounting brackets and said keel rollers in a



predetermined position relative to the normal plane of said flat bed,

(h) a pair of chine roller supporting means to either side of the centerline of said flat bed,

(i) a series of chine rollers mounted on each of said chine roller supporting means for contacting and centering the hull of a boat on said flat bed,

(j) means movably supporting each of said chine roller supporting means,

(k) a pair of openings formed in said flat bed to either side of said openings formed along the centerline of said flat bed through which said chine roller supporting means are adapted to be moved into an elevated position with respect to the normal plane of said flat bed, and

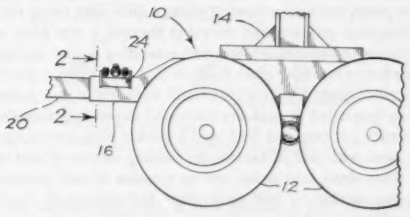
(l) means for releasably latching said chine roller supporting means in a predetermined position with respect to the normal plane of said flat bed of said trailer.

4,103,927

CORNER MOUNT REACH CLAMP WITH HINGED CLAMP PADS

Kenneth J. Schmidt, Thurston, Oreg., assignor to General Trailer Company, Inc., Springfield, Oreg.

Filed Mar. 17, 1977, Ser. No. 778,661
Int. Cl.[2] B60D 1/14
U.S. Cl. 280—482 **9 Claims**



1. In a trailer,

an elongate trailer member having a substantially rectangular opening therein,

an elongate reach member having a cross section substantially complementary to said opening in said trailer member, said reach member extending telescopically into said

opening in the trailer member permitting adjustment therebetween, and

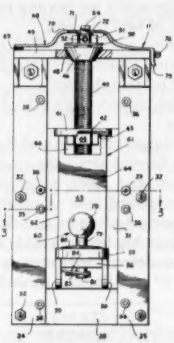
clamping means for securing said reach member in a selected adjusted position relative to said trailer member comprising a pair of clamping members hingedly interconnected for swinging relative to one another, said clamping members being mounted on said trailer member and positioned to engage angularly disposed side portions of said reach member adjacent a corner thereof and operating means engaging said clamping members operable to urge said clamping members to swing toward each other to conform to the angle between such side portions and to force said clamping members against said side portions of said reach member to frictionally secure the same within said trailer member.

4,103,928

ADJUSTABLE TRAILER HITCH WITH INTERCHANGEABLE CONNECTING MEANS

Walter R. Sheppard, Jr., P.O. Box 797, Fletcher, N.C. 28732

Filed Feb. 18, 1977, Ser. No. 769,922
Int. Cl.[2] B60D 1/16
U.S. Cl. 280—490 R **3 Claims**



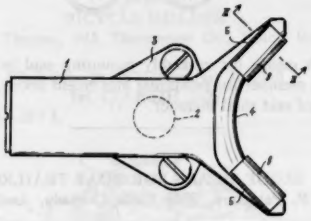
1. An adjustable trailer hitch for attaching a trailer to a traction vehicle, said trailer hitch being carried by said traction vehicle and comprising a mounting plate fixed to said traction vehicle, a pair of spacer plates fixed to said mounting plate and parallel to each other, a pair of face plates juxtaposed on said spacer plates and extending beyond said spacer plates for forming a pair of vertically disposed parallel grooves between said face plates and said mounting plate, a slide plate being received within said grooves and movable therein, a top plate at the upper end of said face plates and extending across said mounting plate, a traveller plate fixed to said slide plate, a jackscrew mounted generally parallel to said slide plate, said jackscrew being journaled in said top plate and depending therefrom, a traveller nut engaged with said traveller plate and threadedly engaged with said jackscrew for causing motion of said traveller plate along said jackscrew on rotation of said jackscrew, a tongue carried by said slide plate and extending outwardly therefrom, a socket in said tongue, said hitch member including a shank receivable in said socket, said traveller plate being located generally at the top of said slide plate, said tongue being located generally towards the bottom of said slide plate, and a box extending between said tongue and said traveller plate, said box being fixed to both said tongue and said traveller plate and at least partially enclosing said jackscrew.

4,103,929

SKI BINDING

Jean Joseph Alfred Beyl, 10 Boulevard Victor-Hugo, Nevers, Nievrè, France

Filed Aug. 2, 1976, Ser. No. 710,897
Claims priority, application France, Aug. 5, 1975, 75 24342
Int. Cl.[2] A63C 11/00
U.S. Cl. 280—611 **5 Claims**



1. In a ski binding for engagement with a ski boot of the kind including structure for mounting on a ski, said structure including a generally arcuate cheek for engagement selectively with the opposite sides of the sole and upper of the ski boot, the improvement which comprises:

(i) a pair of horizontally spaced, transverse ribs each extending across respective outer portions of said cheek, projecting in a direction to overlie at least partially the sole of the ski boot, bridging sections of less thickness than said ribs connecting each of said ribs to said cheek, and

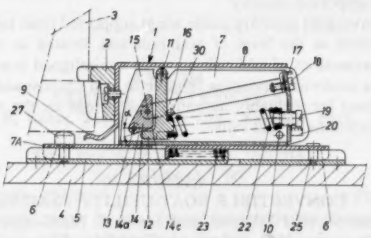
(ii) a pair of resiliently deformable slip lining means shaped to respectively fit about each rib and engaging the same by resilient deformation, each of said slip lining means having opposed internal transverse edges grasping opposite sides of the respective bridging sections and at least externally being formed of material selected to have a low coefficient of friction.

4,103,930

HEEL HOLDER FOR SKI BINDINGS

Alfons Valoh, Vienna, Austria, assignor to TMC Corporation, Baar, Zug, Switzerland

Filed Feb. 16, 1977, Ser. No. 769,269
Claims priority, application Austria, Feb. 18, 1976, 1142/76
Int. Cl.[2] A63C 9/08
U.S. Cl. 280—614 **11 Claims**



1. A heel holder for a safety ski binding for use on the upper surface of a ski, comprising:

a base member having means defining a locking projection thereon, said locking projection having an inclined slideway surface thereon, the inclination of which is variable relative to said upper surface of said ski;

sole holder means pivotally supported to said base member for movement about a pivot axis;

a locking member pivotally supported on said sole holder means, said locking member having lip means thereon extending beneath said locking projection when said sole holder means is in a position of use;

resilient means extending between said base member and said locking member to resiliently urge said locking member into engagement with and beneath said slideway surface, said locking projection being maintained beneath said locking projection and in engagement with said locking surface by the force of said resilient means; and

adjustment means for adjusting and fixably locating the inclination of said slideway surface in selected positions relative to said upper surface of said ski.

4,103,931

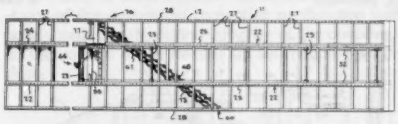
EXTENSIBLE VEHICLE TRAILER WITH SAFETY LOCKING BAR AND CABLE AND HOSE SUPPORTING OUTRIGGERS

Frederick A. Weiss, 1148 Gypsy La., Towson, Md. 21204

Filed Aug. 10, 1977, Ser. No. 823,519

Int. Cl. B62d *53/06*

U.S. Cl. 280—656 **20 Claims**



1. A longitudinally adjustable extensible trailer to be drawn by a truck tractor, comprising a main front frame section and a rear frame section telescopically interfitted with the front frame section, the front frame section adapted to have its front end supported by a truck tractor and the rear frame section having a wheel assembly carried thereby providing rear support for the trailer, the front frame section including a pair of longitudinal I-beams forming the main supporting beams therefor held in laterally spaced parallel relation, the rear frame section having a pair of longitudinal I-beams forming the main supporting beams therefor held in laterally spaced parallel relation located immediately inwardly of the pair of parallel I-beams of the front frame section forming companion pairs of relatively longitudinally movable I-beams, roller means carried on said I-beams of the front frame section and on said I-beams of the rear frame section disposed in rolling contact with the I-beams of the other frame section to allow relative longitudinal movement between the front and rear sections to permit lengthening and shortening of the trailer, manually operable locking means for locking the rear frame section against relative lonitudinal movement with respect to the front frame section at different length adjustment positions over a predetermined range of lengths between maximum and minimum length limit positions, an elongated floating safety locking bar extending through said longitudinal I-beams of said rear frame section supported thereby for axial sliding movement in a horizontal transverse position, said safety locking bar having a length corresponding closely to the spacing between the confronting vertical surface portions of the longitudinal I-beams of said front frame section and being captured in the longitudinal I-beams of the rear frame section by said surface portions of the I-beams of the front frame section, and front and rear stop members on the longitudinal I-beams of said front frame section extending toward the adjacent companion I-beams of the rear frame section and into the path of movement of the end portions of said floating safety locking bar when the front and rear frame sections are being lengthened or shortened to engage the end portions of the safety locking bar at said limit positions and prevent complete disengagement of the rear frame section from the front frame section.

4,103,932

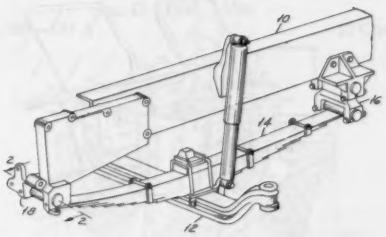
PIVOT CONSTRUCTION FOR A MOTOR VEHICLE SUSPENSION SYSTEM

Robert J. Parker, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 26, 1976, Ser. No. 735,464

Int. Cl.² B60G *11/12*

U.S. Cl. 280—718 **7 Claims**



1. A pivot means constructed to interconnect first and second members for angular displacement of one of said members relative to the other of said members about a fixed pivot axis;

said pivot means comprising a pair of ball studs;

each of said ball studs having a shank portion and a head portion;

said shank portions being in axial alignment with the ends of said shank portions being in juxtaposed relationship;

a sleeve surrounding said shank portions supported by one of said members;

a pair of socket means enclosing said head portions of said pair of ball studs;

each of said socket means being secured to the other of said members.

4,103,933

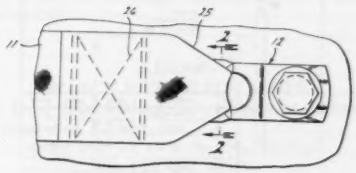
FLOOR ANCHOR FOR SEAT BELT

Robert C. Fisher, 4210 N. Dixie, West Palm Beach, Fla. 33407, and Cecil A. Collins, Pontiac, Mich., assignors to Robert C. Fisher, West Palm Beach, Fla.

Continuation of Ser. No. 648,399, Jan. 12, 1976, abandoned. This application May 31, 1977, Ser. No. 802,025

Int. Cl.² B60R *21/10*

U.S. Cl. 280—744 **1 Claim**



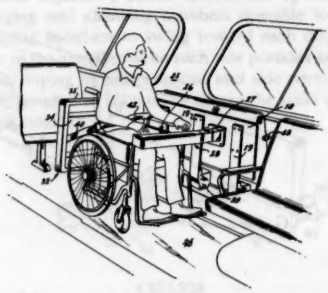
1. An anchor plate for a belt having a pair of apertures located adjacent to the opposite ends of the plate, and a belt having a folded end portion which extends through one of said apertures, securing means extending through said other aperture of the plate, the portion of the plate between said other aperture and the adjacent end being of sinuous form to limit the angular movement of the plate when engaging an element which extends within said sinuous form.

4,103,934

FOLDING SEAT AND WHEELCHAIR RESTRAINT

Jack C. Arnbolt, Loudonville, and Ronald J. Main, Wooster, both of Ohio, assignors to Rohr Industries, Incorporated, Chula Vista, Calif.

Filed Aug. 10, 1977, Ser. No. 823,211
Int. Cl. B60r *21/10*
U.S. Cl. 280—744 6 Claims



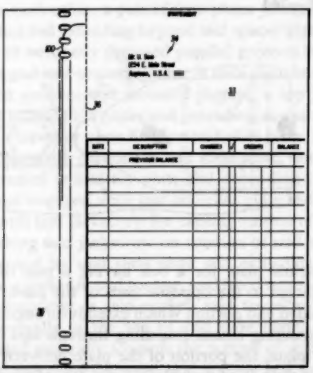
1. A wheelchair restraint assembly for a vehicle comprising:
a barrier fixedly attached to said vehicle and positioned substantially transverse to the longitudinal axis of said vehicle;
a vehicle passenger seat having a seat back portion fixedly secured to said vehicle and a seat bottom portion pivotally attached to said seat back portion, said seat bottom portion pivotable between a normal horizontally oriented passenger seating position and a vertical oriented passenger non-seating position; and
a restraint arm pivotally attached to the under surface of said seat bottom portion, said restraint arm being pivotable between a stored position adjacent said seat bottom portion oriented substantially parallel to said longitudinal axis of said vehicle to a wheel chair restraint position substantially parallel to said barrier whereby a wheelchair positioned between said barrier and said restraint arm is restrained thereby.

4,103,935

ACCOUNTS RECEIVABLE SYSTEM

Arnold Henry Adler, Penfield, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 6, 1977, Ser. No. 803,482
Int. Cl.[2] B42D *12/02*
U.S. Cl. 283—66 R 4 Claims



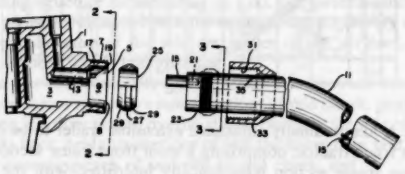
1. An accounts receivable system having a ledger card and a statement for use with a pegboard,
said ledger having alignment perforations for mounting the ledger on the pegboard, and
said statement also having alignment perforations for mounting the statement on the pegboard over the ledger,
both the ledger and the statement being printed with entry points for various entries to be made representing a transaction, such transactions to be posted to the ledger concurrently with the posting on the statement,
the said ledger also bearing a stencil at the top thereof positioned so that an address entered thereon may conform to the position of an address used in a standard window envelope, and
the statement bearing a marginal guideline corresponding to the upper left-hand corner of the ledger so that the ledger can be fitted into the marginal guideline to transfer an address entered on the stencil of the mating ledger to the statement by stencil transfer.

4,103,936

NOZZLE SPOUT COUPLING

Grenville G. Sutcliffe, Villa Ridge; Roy F. Washausen, St. Louis; William L. Tomes, St. Clair, and Herman Ray Gould, Sullivan, all of Mo., assignors to Husky Corporation, Pacific, Mo.

Filed Feb. 14, 1977, Ser. No. 768,204
Int. Cl.[2] F16L *35/00*
U.S. Cl. 285—26 8 Claims



1. In a dispensing nozzle, a nozzle body having an outlet nipple with external threads, a main fuel passage communicating with said nipple, a replaceable spout assembly comprising a cylindrical spout having its inlet end matingly received in said nipple and an annular gland mounted on the inlet end of said spout with its upstream end engaged by the rim of said nipple, said spout being formed with a knurled band and a smooth surface adjacent thereto, said knurled band underlying only the upstream end of said gland and radially expanded into locking engagement with said gland, and a clamp nut on said spout having internal threads engaged with said nipple external threads and having an internal taper at its downstream end in compressive engagement with the downstream end of said gland for compressing the latter radially into sealing engagement with said smooth surface of said spout downstream from said knurled band and for compressing said gland axially and sealingly against the rim of said nipple and thereby coupling said spout securely to said nozzle body.

4,103,937

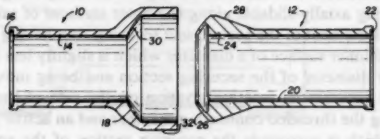
SELF-ALIGNING PERMANENT FITTING

Fancher B. Wakefield, Holbrook, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Nov. 26, 1976, Ser. No. 745,386
Int. Cl.[2] F16L *17/00*
U.S. Cl. 285—110 5 Claims

1. Coupling means capable of connecting two sections of high pressure fluid carrying conduit, said coupling comprising:
a socket element having one end adapted to receive and thereby be a continuation of a first conduit to be coupled, said socket element having a bell mouth including an integral cylindrical projection extending about and from a concave interior spherical sealing surface having a predetermined radius and located a predetermined distance inwardly of the end of the cylindrical projection;

a bulbous seat element having one end adapted to receive and thereby be a continuation of a second conduit, said bulbous seat element having a body, a flexible lip on the other end having a convex exterior spherical sealing surface of another predetermined radius, said flexible lip being on an integral raised portion of said body to snuggly fit within the cylindrical projection of the socket element, and a cam surface fairing the raised portion to the body behind the flexible lip of the second seat element, said cam surface being on an incline that will allow said cylindrical



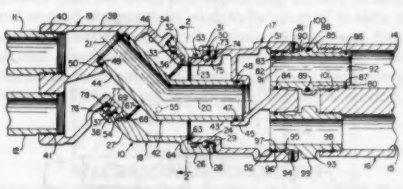
projection of said socket element in contact with said cam surface of said bulbous seat element to draw said socket element and said bulbous seat element together regardless of angular misalignment such that said concave interior spherical surface and said convex exterior spherical surface have an uninterrupted abutting contact one with the other over a wide expanse determined by the contact force of the cylindrical projection on the cam surface to solely maintain the sealed integrity of the coupling means at the contact of the flexible lip and concave sealing surface.

4,103,938

SWIVEL CONNECTOR

Donald A. Lasater, Fairfield, and Steven R. Ebbesmeyer, Middletown, both of Ohio, assignors to Dover Corporation, New York, N.Y.

Filed Aug. 10, 1976, Ser. No. 713,257
Int. Cl.[2] F16L *39/00*
U.S. Cl. 285—136 **28 Claims**



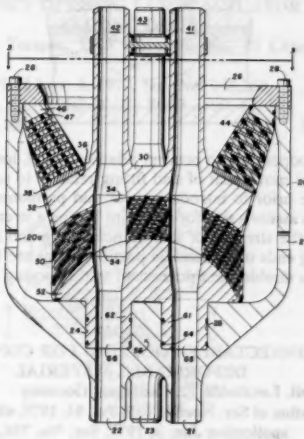
1. A swivel connector adapted to connect a pair of flexible hoses or the like to a pair of passages or the like in a member to allow fluid flow between one of the hoses and one of the passages and fluid flow between the other of the hoses and the other of the passages including a first member having first means connected to one of the passages and second means connected to the other of the passages, a second member, means rotatably connecting said first and second members for relative rotation therebetween about a first axis so that either of said first and second members can rotate through 360° relative to the other of said first and second members about the first axis, a third member, means rotatably connecting said second and third members for relative rotation therebetween about a second axis at an angle to the first axis so that either of said second and third members can rotate through 360° relative to the other of said second and third members about the second axis, said third member having first means for connection to one of the hoses and second means for connection to the other of the hoses, said first member, said second member, and said third member having first passage means connecting said first means of said first member and said first means of said third member to allow fluid flow therebetween and second passage means connecting said second means of said first member and said second means of said third member to allow fluid flow therebetween.

4,103,939

MULTI PASSAGE FLEXIBLE CONNECTOR

John T. Herbert; Frank J. Kovitch, both of Arlington, and Paul E. Sullivan, Euless, all of Tex., assignors to Murdock Machine & Engineering Company, Irving, Tex.

Filed Jun. 15, 1976, Ser. No. 696,396
Int. Cl.[2] F16L *39/04*
U.S. Cl. 285—137 A **11 Claims**



1. In a flexible connector for interconnecting a plurality of input and output conduit pairs for relative angular deflection between mating input and output conduits wherein a ported cup receives a nipple having an outwardly flared wall structure, the combination comprising:

(a) an outer reinforced elastomeric annular support between and in contact with the outer surface of said wall structure and the wall of said cup,

(b) an inner reinforced elastomeric seal between and in contact with the inner surface of said wall structure and structure within said cup, and

(c) structure forming a plurality of laterally offset and spaced apart flow channels individually interconnecting said input and output conduits and extending through said nipple including flow ports through said wall structure and through the body of said inner elastomeric seal with the axis of each being laterally offset from the axis of said cup.

(d) and means for retaining said combination is assembled relationship.

4,103,940

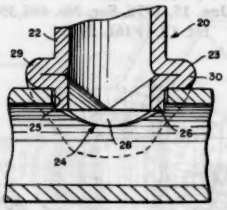
BRANCH FITTING FOR A PIPE

Franklin Deloy Bills, Elkhart, Ind., assignor to Elkhart Products Corporation, Elkhart, Ind.

Filed Dec. 30, 1976, Ser. No. 755,816
Int. Cl.[2] F16L *41/00*
U.S. Cl. 285—189 **2 Claims**

1. A branch fitting for permanent attachment to the periphery of a pipe comprising a single tubular portion having an inner diameter the same as the inner diameter of said pipe, saddle portion means having its undersurface generally conforming to the outer surface of said pipe, said saddle portion means having opposing ends extending outwardly and opposing sides extending outwardly and downwardly from the base of said tubular portion, extended pilot means circumferentially interrupted at two diametrically opposed positions aligned

with said sides, the edges of said pilot means defining the interrupted portions terminating flush with the outer surface of said pipe, said extended pilot means projecting downwardly from the junction of said saddle portion and said tubular portion for insertion into an opening in said pipe, and means for permanently attaching said branch fitting to the periphery of said pipe, said saddle portion means and said extending pilot



means cooperating to prevent relative lateral, longitudinal and rotational movement of said fitting relative to said opening in said pipe prior to introduction of said permanent attachment means to assure a size-for-size joint having a strength at least as great as the strength of said branch fitting and said pipe, said opposing ends of said saddle portion means are formed with a thickness double the thickness of said opposing sides thereof.

4,103,941

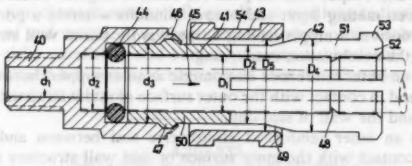
DISCONNECTABLE COUPLING FOR CONDUITS OF DEFORMABLE MATERIAL

Kurt Stoll, Lenzhalde 72, Esslingen, Germany

Continuation of Ser. No. 595,619, Jul. 14, 1975, abandoned. This application Jan. 3, 1977, Ser. No. 756,002

Int. Cl.[2] F16L *33/18*

U.S. Cl. 285—238 **1 Claim**



1. A disconnectable coupling device in the form of a plug-in-socket-connection for conduits of deformable material, which comprises, at one end, a socket having a bore adapted to receive the end of a conduit, at the other end, a threaded connecting member having three coaxial bores of different diameters, the first bore of the three being nearest the socket and having a diameter approximately equal to the outside diameter of the socket, the second bore of the three being adjacent to the first bore and having a diameter approximately equal to the inside diameter of the socket, and the third bore of the three being adjacent to the second bore and nearest the free end of the connecting member and having a diameter smaller than that of the second bore and corresponding to the inner diameter of the conduit to be connected to the device, an end of said socket being partially inserted into the first bore of the said threaded connecting member, said inserted end of the socket including an annular projection on the outside surface thereof and the threaded connecting member including an annular recess on the inner surface thereof adapted to receive the annular projection, the device further including a sealing ring located between the inserted end of the socket and the intersection of the first and second bores of the threaded connecting member, and a securing device to fix the inserted conduit in position, said socket being subdivided by longitudinally extending slots into a plurality of resilient collet chuck elements uniformly distributed around the periphery and having a generally smooth bore surface including one projecting annular tooth element spaced a distance from the free end of the socket, which collet chuck elements upon insertion of the end of the conduit into the bore of the socket surround from the outside the inserted end of the conduit which is without support at its inner side, the socket having at least one outer conical portion with the outer diameter increasing in the axial direction towards a securing section at the free end thereof, said securing section having an inclination which is less than that of the conical portion, said conical portion and said securing section including at least partially the outer surfaces of said collet chuck elements, said securing device comprising a securing ring axially slidable along the outer surfaces of said collet chuck element of the socket, said securing ring having a cylindrical inner surface of a diameter which is slightly less than the outer diameter of the securing section and being movable by hand between an inactive position on the side of the socket facing the threaded connecting member and an active position in which it surrounds the securing section of the socket, in which active position the securing ring forces the collet chuck elements into their locking position in which they clamp the end of the conduit in the manner of a collet chuck and in which active position the securing ring is retained by self-locking.

4,103,942

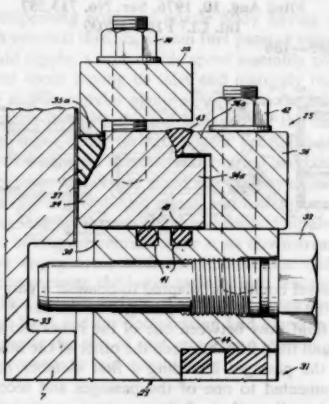
SEAL FOR SUBMERSIBLE PIPE SWIVEL

William L. Kiely, Houston, Tex., and Kristen I. Pedersen, Armonk, N.Y., assignors to Sotec, Inc., Tex.

Filed Aug. 30, 1976, Ser. No. 718,564

Int. Cl.[2] F16L *27/00*

U.S. Cl. 285—276 **4 Claims**



1. The combination with first and second conduits of swivel bearing means sealingly interconnecting the same, said bearing means having inner and outer swivelling members, respectively sealingly secured to said conduits, means loosely securing said inner swivelling member to said first conduit, a seal-carrying ring encompassing and slightly spaced from said first conduit adjacent to said inner swivelling member, means sealing securing said seal-carrying ring to said inner swivelling member, a yieldable sealing gasket interposed between said seal-carrying ring and said first conduit, and means to adjust the tightness of said gasket to avoid leakage between said first conduit and said inner swivelling member without affecting the ease of movement of said outer swivelling member and said second conduit.

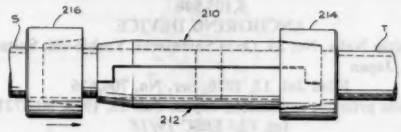
4,103,943
PIPE COUPLING

Hoyt S. Curtin, 3706 Capstan Cir., Westlake, Calif. 91361

Continuation-in-part of Ser. No. 695,462, Jun. 14, 1976, which is a continuation-in-part of Ser. No. 537,093, Dec. 30, 1974, Pat. No. 3,971,574, which is a continuation-in-part of Ser. No. 329,727, Feb. 5, 1973, Pat. No. 3,857,588. This application Nov. 4, 1976, Ser. No. 738,753

Int. Cl.[2] F16L *13/10, 47/00*

U.S. Cl. 285—419 5 Claims



1. A device for coupling first and second pipes having open ends spaced by less than a predetermined distance to form a water-tight seal therebetween, said device comprising:

first and second pipe sections each comprised of a substantially semi-cylindrically shaped wall having first and second longitudinal edges and an outer circumferential surface extending from said first edge to a first shoulder extending parallel to and spaced from said second edge, and an inner circumferential surface extending from said second edge to a second shoulder extending parallel to and spaced from said first edge, said wall being of substantially uniform thickness between said first and second shoulders and of reduced thickness between said first shoulder and said second edge and between said second shoulder and said first edge;

first and second end collars each comprised of a tubular wall having inner and outer surfaces, said collar inner surface including a first portion shaped to conform to, but dimensioned slightly greater than, the outer circumferential surface of one of said pipes so as to be adapted to slide along and be adhesively adhered thereto, and a second portion shaped to conform to and dimensioned slightly greater than the outer circumferential surface of said first and second pipe sections so as to be adapted to slide along and be adhesively adhered thereto to mate said first and second pipe sections to one another with the reduced thickness wall portions of each section overlapping the reduced thickness wall portions of the other section.

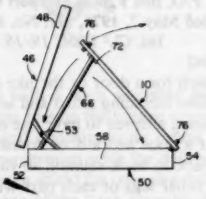
4,103,944
MACRAME BOARD AND KIT

Jim Alvarado, and Richard G. Righter, both of 9000 Foothill Blvd., Sunland, Calif. 91040

Filed May 20, 1976, Ser. No. 688,379

Int. Cl.[2] D03J *3/00;* D04G *3/02, 5/00*

U.S. Cl. 289—18 11 Claims



1. A macrame board for fabricating items by the knotting of cords, comprising:

a board having top, bottom and side peripheral edges, a central area provided with an array of apertures, the bottom peripheral edge of the board having a laterally extending scalloped section substantially coextensive with said apertured area, the top peripheral edge of the board being formed with a single cutout section substantially coextensive laterally with said apertured area, and each of the opposed side peripheral edges having a plurality of peripherally spaced inwardly directed slots, at least one of said slots being in the configuration of an inwardly pointing arrow; and

starter means removably attached to said board adjacent said top peripheral edge for holding the finished portion of said item during the course of fabrication.

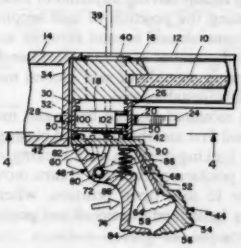
4,103,945
EMERGENCY OPENING LATCH ACTUATOR FOR SLIDING DOOR

Thomas Bray Turman, 1280 Clarendon St., El Cajon, Calif. 92021

Filed Nov. 3, 1977, Ser. No. 848,268

Int. Cl.[2] E05C *19/10;* E05B *3/00, 65/10*

U.S. Cl. 292—100 9 Claims



1. In combination with a sliding door structure including a fixed jamb, a sliding door having a frame member to seat against the jamb, a latch unit mounted on the frame member and having a latch element selectively engageable with the jamb to lock the door, an actuator coupled to said latch element and having an extended operating lever for moving the latch element between locked and unlocked positions, and a housing enclosing said latch unit, the improvement comprising:

a handle mounted on said housing;

said handle having a grip portion for gripping by a hand to open the door, the grip portion being pivotally mounted to move between a rest position and an open position;

and an adapter coupled between said actuator and said grip portion to unlock the latch element when the grip portion moves to the open position.

4,103,946
FLUSH SET LOCK FOR SLIDING DOORS

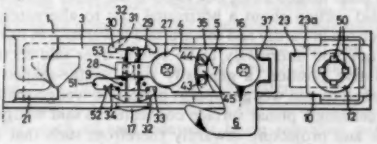
Donald Henry Tipler, Hunts, England, assignor to Schlegel (UK) Limited, Leeds, England

Filed Jan. 26, 1977, Ser. No. 762,583

Claims priority, application United Kingdom, Jan. 29, 1976, 3518/76

Int. Cl.[2] E05C *5/00, 19/12*

U.S. Cl. 292—114 12 Claims



1. A bolt mechanism for use in a sliding door or the like for interengagement with a keeper, comprising:

a body having a rectilinear slideway with a closing position and an open position;

a first member located in said rectilinear slideway, said first member having manually operable means for sliding said first member between said closing and open positions and having second member pivotal mounting means;

a second member pivotally mounted on said first member by said second member pivotal mounting means, having engagement means and having a hook-shaped bolt means with a free end portion, said bolt means extending laterally from said second member with the free end portion projecting generally parallel to said rectilinear slideway;

second member holding means for holding the second member with its bolt means in a predetermined closing attitude, said second member holding means comprising resilient biasing means and second member stop means engageable by said second member engagement means, said resilient biasing means being arranged to urge said second member rotationally into said predetermined closing attitude defined by said second member stop means, at least one of said second member engagement means and said second member stop means having adjustment means for, respectively, adjusting the position of said second member engagement means on said second member and the position of said second member stop means, whereby said predetermined closing attitude of said second member with its bolt means is adjustable; and

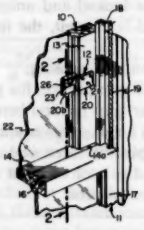
locking means mounted on said body and manually moveable when said first member is in said closing position, into and out of a locking position, said locking means when in said locking position preventing return movement of said first member to said open position, whereby said first member may be locked in said closed position.

4,103,947

VENTILATION STOP FOR WINDOWS

John H. Delaney, 146-25 20th Rd., Whitestone, N.Y. 11357

Filed Feb. 4, 1977, Ser. No. 765,632
Int. Cl.² E05C *3/02*
U.S. Cl. 292—194 **3 Claims**



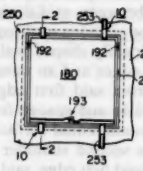
1. A ventilation stop adapted to be mounted to the side rail of the upper window sash of a double-hung window a predetermined distance above the upper horizontal rail of the lower sash, comprising a generally rectangular mounting plate, means for securing said mounting plate in a normally installed position to said side rail such that a section of said mounting plate extends from said side rail generally parallel to and above said upper horizontal rail, said section having an upper horizontal edge in said normally installed position, a wedge support plate hinged along one edge to the upper horizontal edge of said section about a horizontal axis to alternately depend therefrom inwardly and toward said lower sash in its operative position and alternately to be swung over said section in its operative position, a generally rigid wedge-shaped member attached to said wedge support plate, said wedge-shaped member defining a planar surface connected to said wedge support plate and projecting inwardly therefrom such that a part of said planar surface lies toward and into the path of the upper horizontal rail of the lower sash during relative movement between the upper sash and the lower sash thereby effecting a stopping and jamming action of said horizontal rail against said planar surface, said wedge-shaped member further including an upper surface interconnecting said support plate and said planar surface and being horizontal in the operative position, said surface being vertical and acting as a stop and abutting said section to limit swinging movement of said wedge support plate in the inoperative position when the latter is swung about said horizontal axis up and over the section of said mounting plate to which said support plate is hinged.

4,103,948

ANCHORING DEVICE

Hiromitsu Naka, No. 39, Oaza Shinmachi, Yashio-shi, Saitama-ken, Japan

Filed Jul. 12, 1976, Ser. No. 704,616
Claims priority, application Japan, Jul. 18, 1975, 50-87216
Int. Cl.² E05C *19/18*
U.S. Cl. 292—256 **9 Claims**



1. In combination;

an access door for a rough opening in a panel such as a ceiling or wall panel and having an outer frame adapted to be fitted into the rough opening, an outwardly extending flange integral with the outer end edge of said outer frame extending laterally outwardly of the frame for engaging the outer face of the panel around said rough opening, and an inwardly extending flange integral with the inner edge of the frame on the opposite side of the panel from the outwardly extending flange; and

an anchoring device comprising a hanger member having a support arm portion with a threaded hole at one end thereof, and a hook portion integral with the other end of said support arm portion and depending therefrom and engaging with the inwardly extending flange, and a screw-threaded clamping member screw-threadedly engaged in said threaded hole and having the free end extending from the support arm portion in the same direction as said hook portion depends for engagement with the rear face of said panel.

4,103,949

SAFETY DOOR LATCH

Jose B. Bouloy, P.O. Box F2666, Freeport G.B.I., The Bahamas

Filed May 7, 1976, Ser. No. 684,117
Int. Cl.² E05C *19/18*
U.S. Cl. 292—342 **6 Claims**

1. A safety latch for a door or the like comprising:

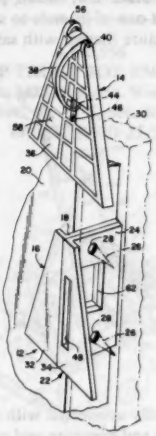
a keeper element including a first and second L-shaped part, each part being adapted to have one of its legs attached to the edge of a door and a door frame or the like, respectively, in back to back relation so that when the door is closed the other legs of each part will be in abutment in the same vertical plane parallel to but spaced apart from the door and door frame;

a latch element adapted to be slid and positioned over the other legs of said keeper element to retain the first and second parts of said keeper element in abutment so they cannot be separated to prevent opening of a door, said latch element including,

a hollow sleeve having a complemental shape to said other

legs of each keeper part when they are positioned in back to back relation; and

handle means for raising and lowering said sleeve relative to said keeper element parts, said handle means being pivotally connected to said sleeve and including a hook at the



end thereof remote from said pivotal connection, a slot in said sleeve, and a complemental slot in said other leg of one of said keeper parts, the hook on said end of said handle means being received within said complemental slots to preclude removal of said sleeve from said keeper parts.

4,103,950

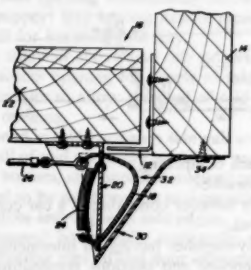
LATCH SHIELD

Daniel C. Yunt, 928 Susan Lee La., Modesto, Calif. 95350

Filed Oct. 28, 1976, Ser. No. 736,719

Int. Cl.[2] E05C *3/06*

U.S. Cl. 292—346 **4 Claims**



1. In combination with a latch assembly including a door stop, a tongue, a spring biasing the tongue toward engagement with the door stop, and a manipulating means for pulling the tongue away from engagement with the door stop against the bias of the spring, a latch shield for covering the latch assembly and preventing opening of the latch assembly from outside of a closure associated with the latch assembly, the latch shield comprising a cover member separate from the latch assembly and having a hollow interior arranged for protectively receiving the latch assembly with engaging the latch assembly, and provided with a mounting means for permitting attachment of the member to a stationary frame part associated with the closure.

4,103,951

SEMI-PNEUMATIC ENERGY ABSORBING BUMPER SYSTEM FOR MOTOR VEHICLES

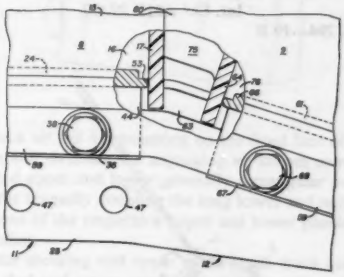
Thomas A. Bank, Carmel, Ind.; Jack E. Gieck, and David A. Weitzenhof, both of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 638,388, Dec. 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 552,932, Feb. 25, 1975, Pat. No. 3,989,292, which is a continuation-in-part of Ser. No. 426,615, Dec. 12, 1973, Pat. No. 3,902,748. This application Jun. 6, 1977, Ser. No. 803,826

The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.

Int. Cl.[2] B60R *19/00*

U.S. Cl. 293—71 P **7 Claims**



1. A non-pressurized bumper comprising

an elastomeric member having an impact face and rearwardly extending walls terminating in a partially continuous bead;

a closure plate received within said member and abutting the inner surfaces of said walls;

a clamp mounting said bead on said closure plate; and

means venting directly to the atmosphere through, and at an edge of, said closure plate.

4,103,952

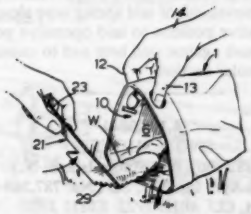
COMBINATION BAG AND SCOOP

John Douglas Thompson, 2660 Midland Ave., Agincourt, Ontario, Canada

Filed May 9, 1977, Ser. No. 794,834

Int. Cl.[2] A01K *29/00*; A47L *13/52*

U.S. Cl. 294—1 R **7 Claims**



1. A bag used for cleaning waste material, said bag including a closed bottom portion for holding waste material, an upper portion having an open mouth for insertion of waste material into said bag, and closing means for closing said bag after inserting waste material therein, said bottom portion being constructed of a flexible impermeable material, said upper portion including two relatively flat parallel sidewalls adjacent one another, each of said sidewalls being provided with a finger insert at one end thereof such that both of the inserts are located at the same end of the upper portion, said upper portion being rigid to the extent that upon insertion of a finger and

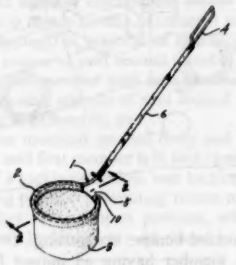
a thumb or a pair of fingers in said inserts said mouth is spread open by spreading a finger and a thumb and bowing said sidewalls, said upper portion also being resilient to the extent that upon withdrawal of a finger and a thumb from said inserts said sidewalls tend to resume their flat parallel relationship, the size of the bag being such that it is easily opened by one hand with the thumb and finger firmly engaged in said finger inserts, said closing means being located on said bag such that said bottom portion is closed after use by the closing means for closing said bag and its contents.

4,103,953

PORTABLE ANIMAL SANITARY DEVICE

Gilles Raoul Lachance, 56 Place Montmorency, Laval, Canada (H7N 1T6)

Filed Aug. 30, 1977, Ser. No. 829,584
Int. Cl.[2] A01K *29/00*
U.S. Cl. 294—19 R **2 Claims**



1. A portable animal sanitation device comprising a rigid, one-piece, rod-like frame including a straight handle section integrally joined at one end to one end of an annular section having a free end terminating short of and adjacent the junction of said straight and annular sections, said annular section lying in a plane making an obtuse angle with said handle section, a spirally wound spring wire surrounding said frame and slidable along the same between an inoperative position in which said spring wire is substantially co-extensive with said handle section and terminates at said junction, and an operative position in which the spring wire extends along both said handle section and said annular section and terminates close to said free end of said annular section, and a disposable bag having a hem at its top edge extending along the greater part of the length of said top edge and opened at both its ends and removably receiving said annular section, whereby said frame carries said bag, movement of said spring wire along said frame from said inoperative position to said operative position causing said wire to push against said hem and to cause said bag to come off said annular section.

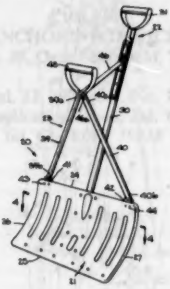
4,103,954

SNOW SHOVEL

John W. Vaslas, 282 Park St., Staten Island, N.Y. 10306

Filed Apr. 14, 1977, Ser. No. 787,360
Int. Cl.[2] A01B *1/22*; E01H *5/02*
U.S. Cl. 294—54 **14 Claims**

1. A snow shovel, comprising a plate-shaped scoop having a top edge, a bottom ground-engaging edge, and opposite side edges, a main handle rod rigidly affixed at one of its ends to the medial region of said scoop, a first hand grip secured to said main handle rod at the other end thereof, a pair of coplanar auxiliary handle rods located frontwardly of said main handle rod and having respective first and second ends, said auxiliary handle rods being closely juxtaposed to one another at said first ends and diverging from one another in the direction of said second ends, the lengths of said auxiliary handle rods and the angle of divergence thereof disposing said second ends of said auxiliary handle rods at a spacing from each other approximating the distance between said side edges of said scoop, a second hand grip secured to said auxiliary handle rods at said first ends thereof and projecting therefrom in a direction generally away from said second ends of said auxiliary handle rods, respective hinge means interconnected between said second ends of said auxiliary handle rods and said scoop adjacent said top edge thereof, a rigid cross-brace bar, means pivotally connecting said cross-brace bar at one of its ends to said auxiliary handle rods adjacent the juncture thereof with said second hand grip,



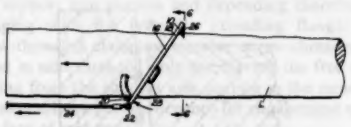
coupling means hingedly connected with said cross-brace bar at the other of its ends and engaging said main handle rod, and means for releasably locking said coupling means to said main handle rod, whereby said coupling means can be adjusted to a plurality of positions along said main handle rod for adjusting the angular orientation of said cross-brace bar between said main handle rod and said auxiliary handle rods and thereby the disposition of said auxiliary handle rods and said second hand grip relative to said main handle rod and said first hand grip.

4,103,955

LOG CINCH

Louis F. Hill, 555 Walnut St., Lebanon, Oreg. 97355

Filed Dec. 6, 1976, Ser. No. 747,692
Int. Cl.[2] B25B *11/00*
U.S. Cl. 294—92 **3 Claims**



1. A log cinch comprising
(a) a body member,
(b) said body member consisting of a bar curved to define a central area,
(c) said body member having an intermediate portion and having opposite end portions terminating in end edges spaced from each other in a cut-out portion forming a transverse opening,
(d) said end portions being spaced from each other an amount sufficient to form an opening large enough to receive a log such that the body member when positioned crosswise over a log can be moved down to receive the log through said opening,
(e) said intermediate portion and one of said end portions of said body member being substantially straight and in straight line alignment with each other and the other end portion of said body member being curved in oblique relation in a forward direction,
(f) line connecting means on said body member adjacent said other end portion to which a pulling line is arranged to be secured whereby upon a forward pull being applied to

said body member at said line connecting means, said body member is moved obliquely of the log to have a binding connection thereto,

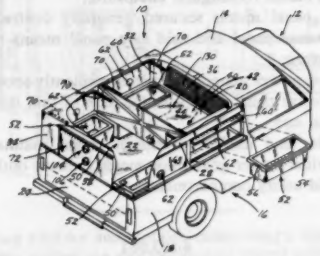
and a rearwardly extending barb on said other end portion of said body member arranged to penetrate into a log for gripping engagement with the log when the body member extends obliquely relative to the log.

4,103,956

PICKUP TRUCK BOX ENCLOSURE

Eugene W. Faulstich, 1415 18th Ave. West, Spencer, Iowa 51301

Filed Nov. 19, 1976, Ser. No. 743,229
Int. Cl.[2] B60D *15/50*
U.S. Cl. 296—10 **12 Claims**



12. In a pickup truck having a cab, and a box including opposite sidewalls, front wall, and rear tailgate, the improvement comprising,

a box enclosure on said box including a top wall, and front and rear end walls and opposite sidewalls operatively associated with the front wall, rear tailgate and opposite sidewalls, respectively of the box so as to form an upper vertical extension thereof,

a support wall situated along one sidewall of said box in a horizontal plane extending substantially through the intersection of said box enclosure and box and said support wall having an opening,

a storage tray, coacting means on said storage tray and support wall for positioning the storage tray in nesting relation in said opening substantially below said support wall, said support tray having handle means above said support wall for handling said tray,

the enclosure sidewall above said one sidewall of said box having an access opening for access to said storage tray and large enough to allow removal of said tray through said access opening,

a door positioned in said enclosure sidewall access opening, said rear wall of said enclosure having an opening defined by top and bottom, and opposite sidewall portions,

a door adapted to be positioned in said opening and having top and bottom and opposite side edges,

oppositely disposed horizontally outwardly extending retractable actuating pins on said door adjacent its top edge,

the opposite side wall portions operatively including horizontally extending slots having inner and outer ends, and stop elements are positioned on said sidewall portions adjacent the inner ends of said slots,

said oppositely disposed pins insertable into the slots in said opposite sidewall portions to support said door,

said door being pivotable about the longitudinal axis of said pins when said pins are positioned in the outer ends of said slots between a vertically closed position and a horizontally raised position and said upper end of said door being adapted to engage said stops when said pins are in the inner ends of said slots to limit downward pivoting of said door to a closed position, and

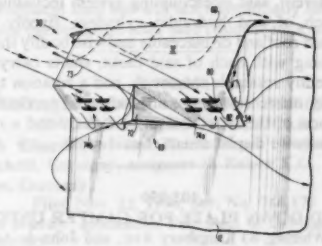
control means on said door connected to said actuation pins for retracting said pins from said slots to allow said door to be removed from said opening.

4,103,957

TRUCK AIR FOILS

Robert G. Landry, 45 Rachel Blvd.,, Lewiston, Me. 04240, and Sherman R. Jenney, 27 Rochelle St., Auburn, Me. 04210

Filed Sep. 21, 1976, Ser. No. 725,258
Int. Cl.[2] B62D *35/00*
U.S. Cl. 296—1 S **14 Claims**



9. A truck air foil for mounting on the front face of a truck cargo box and directing the impinging air stream comprising:

elongated upper and lower generally rectangular panels,

means for hingedly coupling the long lower and upper edge portions of the respective upper and lower panels one to the other,

means for securing said upper panel to the truck cargo box such that said upper panel inclines forwardly and downwardly from the forward face of the cargo box,

means carried by said lower panel for securing the lower panel to the cargo box with the lower panel inclined forwardly and upwardly away from the front face of the cargo box, and

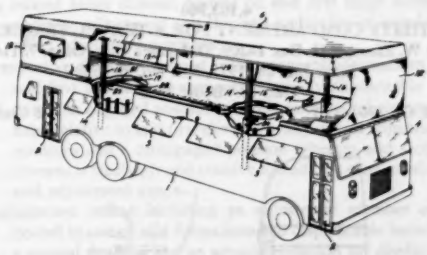
means providing for passage of air between the lower edge portion of said lower panel and the front face of the cargo box into the space behind said upper and lower panels and forwardly of the front face of the cargo box for pressurizing this space, the opposite ends of said air foil behind said panels being open to transmit air from said space outwardly through said opposite open ends.

4,103,958

CAMPING VEHICLE BODY

Jean-Marc Parent, 9e rang, Wickham, Canada

Filed Mar. 30, 1977, Ser. No. 783,009
Claims priority, application Canada, Dec. 30, 1976, 268956
Int. Cl.[2] B62P *3/32*
U.S. Cl. 296—23 C **4 Claims**



1. A camping vehicle body comprising a first floor, a peripheral side wall fixed around said first floor and laterally confining a passenger compartment over said first floor, a roof covering said peripheral side wall and selectively liftable to a desired elevation above said peripheral side wall, a second floor fixedly secured to said peripheral side wall at a fixed height over said passenger compartment and below said roof, collaps-

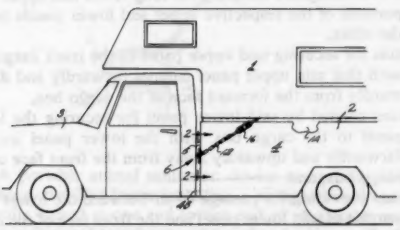
ible side walls positioned at the periphery of said second floor and of said roof and laterally confining a livable compartment between said second floor and said roof, said roof being liftable by means including hydraulic cylinders fixedly connected at the opposite ends to said roof and relative to said peripheral side wall respectively and selectively elevating and lowering said roof upon actuation, and an intercoupling system connected to said hydraulic cylinders and controlling concurrent operation thereof, said intercoupling system including a rack adjacent each of said hydraulic cylinders, fixedly secured relative to said roof and displaceable endwise bodily therewith, a gear meshing with each of said racks, shafts carrying said gears and bodily rotatable therewith, and a rotation transmitting assembly interconnecting said shafts and producing concerted rotation of the latter and of said gears and a resulting concerted endwise displacement of said racks.

4,103,959

HOLD DOWN PLATE FOR CAMPER UNITS

Wesley W. Whiting, 83 Kingsbury Ave., and John A. Anderson, 4422 Ryan St., both of Eugene, Oreg. 97404

Filed Mar. 11, 1977, Ser. No. 776,500
Int. Cl.[2] B60P 3/32
U.S. Cl. 296—23 MC **6 Claims**



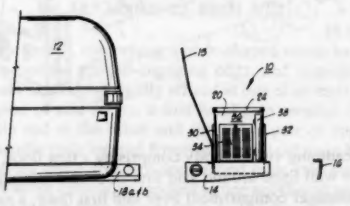
1. In combination with the front wall structure a pick up truck box within which a camper unit is supported for transport, the improvement comprising a hold down plate adapted for securement to the forward side of the front wall of said box structure, said plate including a major portion in abutment with the forward side of said wall, a secondary portion offset forwardly from said front wall and projecting laterally beyond the forward edge of the truck box sidewall and thereat defining an aperture for receiving camper tie down means, an intermediate portion between said major and secondary portions and extending forwardly from said major portion away from the box front wall.

4,103,960

UTILITY COMPARTMENT FOR A TRAVEL TRAILER

Joe W. Ziese, P.O. Box 14209, Oklahoma City, Okla. 73114

Filed Jun. 24, 1977, Ser. No. 809,538
Int. Cl.[2] B60R 9/06
U.S. Cl. 296—37.1 **5 Claims**



1. Utility compartment apparatus for installation and use on a vehicle of the type having on-board living accommodations and which has at least two spaced, longitudinal frame members extending rearward from the vehicle to support the rear bumper assembly, the apparatus comprising:

carrier support frame means having first and second side members each adapted for rigid affixure to said longitudinal frame members, and having a transverse panel with forward and rearward parallel sides bend-formed to extend at 90° upward from said transverse panel, said transverse panel being rigidly secured between said first and second side panels;

side panel means formed as a rectangular enclosure and inserted downward within said first and second side members and said transverse panel parallel bend portions for secure affixure therein;

top lid means hingedly secured over the top of said side panel means rectangular enclosure;

divider panel means secured generally centrally to said transverse panel and said side panel means rectangular enclosure;

electrical power generation means resiliently secured to said transverse panel on a selected side of said divider panel means; and

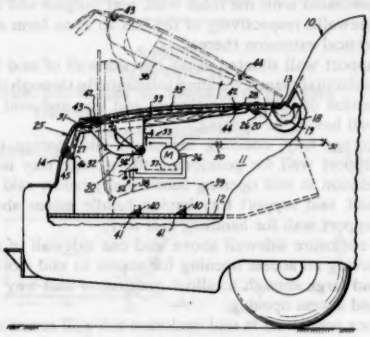
a muffler and muffler extension means maintaining said electrical power generation means exhaust outlet external to said utility compartment.

4,103,961

RUMBLE SEAT

Donald B. Cerf, and Perry J. Dreibus, 5435 Corning Ave., Los Angeles, Calif. 90056

Filed Nov. 8, 1976, Ser. No. 739,544
Int. Cl.[2] B60N 1/06
U.S. Cl. 296—63 **15 Claims**

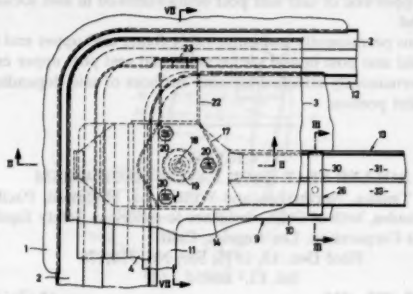


1. A rumble seat for use in the trunk cavity of an automobile body, said cavity having a floor, and an opening bounded by a forward edge, a rear bulkhead and a pair of spaced apart side ledges, and hinge means mounted to the body for pivotally mounting a trunk lid for upward and downward movement to open and to close the said opening, the improvement comprising: a support lid having structure attachable to said hinge means to replace said trunk lid; a fairing attached to the structure and so proportioned and arranged as to close on the periphery of said opening in the same manner as the replaced trunk lid, there being an aperture in said fairing; a back support; pivot means mounted to said structure and said back support, said back support being so proportioned and arranged as to close said aperture in one position and to be pivoted by the pivot means to open and form a back restraint in another position; motor means for moving said back support between said positions; a seat cushion to rest on the floor of the trunk without upward support by the support lid or by the back support; and restraint means restraining the seat cushion from forward and backward movement.

4,103,962
SLIDING ROOF FOR AUTOMOBILES

Albert Schlapp, Sprendlingen, Fed. Rep. of Germany, assignor to Rockwell-Golde G.m.b.H., Frankfurt, Fed. Rep. of Germany

Filed Nov. 9, 1976, Ser. No. 740,342
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1975, 2551335
Int. Cl. B60j 7/10
U.S. Cl. 296—137 E 5 Claims

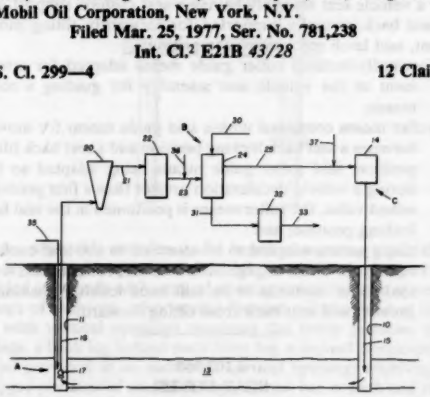


1. A sliding roof for automobiles, comprising a rigid sliding panel, slidably guided in a roof opening on lateral guide rails by means of forward and rear sliding shoes, said guide rails supported by the housing attached to the roof of said automobile, which panel is connected in a pivotally movable and height adjustable manner generally toward the forward edge of said panel with the forward sliding shoes, and the lower face of which is covered with a panel lining secured to a lining frame, said lining frame being attached at the front to a cross-beam which rigidly connects together the forward sliding shoes, at least two spaced apart, stirrup-shaped, forwardly open stop springs are attached to the forward transverse portion of the lining frame on its surface remote from the panel lining, which stop springs can be engaged onto the cross-beam when the lining frame is pushed in from the rear edge of the sliding panel.

4,103,963
CALCITE CONTROL IN AN IN SITU LEACH OPERATION

Wilton F. Espenscheid; Israel J. Heilweil, both of Princeton, N.J., and Tsoung Y. Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 25, 1977, Ser. No. 781,238
Int. Cl.² E21B 43/28
U.S. Cl. 299—4 12 Claims



1. In an in situ leaching circuit wherein a lixiviant is flowed through a calcium-based, uranium and/or other metal values bearing formation from an injection well to a production well to dissolve the uranium and/or metal values and to carry said values to processing equipment on the surface, the method of controlling calcite precipitation in said circuit comprising:

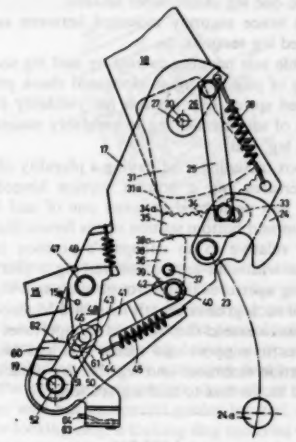
determining the resident time that said lixiviant remains in a critical area of said circuit; and

adding a chemical inhibitor to said lixiviant as said lixiviant enters said critical area to retard the growth of calcite crystals, said chemical inhibitor being added in an amount that will prevent substantial calcite precipitation during said resident time but will not substantially interfere with calcite precipitation after said resident time has expired.

4,103,964
ADJUSTABLE HINGE ASSEMBLY FOR SEAT OF TWO-DOOR MOTOR VEHICLE

Friedrich Klingelhöfer, and Heinz-Jürgen Wagener, both of Remscheid, Germany, assignors to Keiper K.G., Remscheid-Hasten, Germany

Filed Nov. 22, 1976, Ser. No. 744,176
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1975, 2552787
Int. Cl.² A47C 1/026; B60N 1/06
U.S. Cl. 297—367 12 Claims



1. A hinge assembly comprising:

a support;

a first hinge element pivotal on said support about a tipping axis between a rest position and a pivoted position angularly offset therefrom;

a second hinge element pivotal on said first hinge element about an adjustment axis through a plurality of angularly offset adjustment positions;

respective first and second interengageable formations on said first and second elements relatively displaceable between an engaged position wherein said second element is fixed relative to said first element in any of said adjustment positions and a disengaged position wherein said second element is freely pivotal relative to said first element about said adjustment axis;

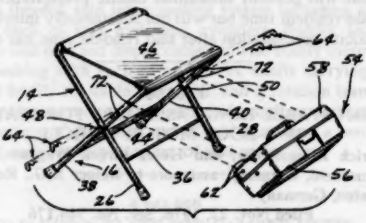
adjustment means including an adjustment member connected to one of said formations and displaceable between a normal position and an actuated position for displacing said one formation and thereby relatively displacing said formations between said engaged and disengaged positions, respectively; and

lockout means including an abutment mounted on one of said elements and operatively engageable with said adjustment member for preventing displacement of said adjustment member into said actuated position except when said first element is in said rest position.

4,103,965
FISHING CHAIR

Norman R. Engman, Des Moines, Iowa, assignor to Emco Industries, Inc., Des Moines, Iowa

Filed Nov. 8, 1976, Ser. No. 739,573
Int. Cl.[2] A47C 9/10
U.S. Cl. 297—192 1 Claim

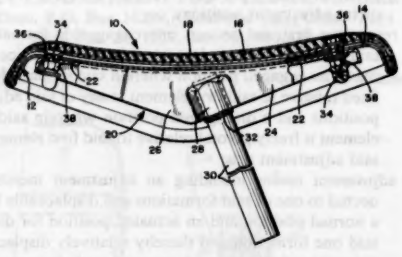


1. A fishing chair comprising:
a pair of inverted U-shaped, two legged folding tubular leg sections wherein one leg of each section is pivotally secured to one leg of the other section,
a support brace securely mounted between each of said U-shaped leg sections,
a collapsible seat member carried by said leg sections,
a plurality of pins having an elongated shank portion and a V-shaped spring clip portion for yieldably embracing a portion of said tubular leg to yieldably maintain said pin on said leg, and
a tackle box including a lid having a plurality of pin receiving apertures and a bottom section hingedly secured thereto and positioned between one of said leg sections such that said bottom section opens forwardly and downwardly relative to an occupant's position on said seat member with said leg section having a plurality of pin receiving apertures therethrough with said shank portion being of such greater length than said V-shaped clip portion so as to extend through said leg apertures into said lid apertures to support said tackle box and said V-shaped clip portion embraces said leg thereby detachably securing said tackle box to said leg section.

4,103,966
SADDLE CONSTRUCTION

David A. Allen, Glendora, Calif., assignor to Huffy Corporation, Miamisburg, Ohio

Filed Sep. 19, 1977, Ser. No. 834,275
Int. Cl.[2] B62J 1/00
U.S. Cl. 297—195 7 Claims

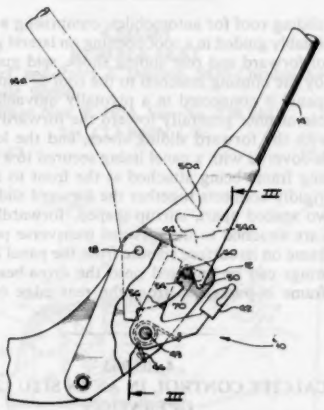


1. A saddle construction comprising:
a saddle pan including a lower plate,
a one-piece saddle support including an upper plate complementary to said lower plate of said saddle pan throughout substantially the length of said saddle pan,
means securing said saddle support to said saddle pan with said upper plate of said support in supporting relationship to said lower plate of said pan,
said saddle support further including a dependent skirt portion extending downwardly from said upper plate along opposite sides thereof throughout substantially the length thereof,
an intermediate section of said depending skirt portion defining a downwardly opening socket,
an elongated seat post,
an upper end of said seat post being received in said socket, and
means permanently and immovably fixing said upper end of said seat post in said socket with said seat post upper end permanently attached to inner surfaces of said depending skirt portion.

4,103,967
ROLLER SEAT BACK LATCH MECHANISM

Akira Tanaka, Northridge, and William M. Hollowell, Pacific Palisades, both of Calif., assignors to American Safety Equipment Corporation, Los Angeles, Calif.

Filed Dec. 13, 1976, Ser. No. 750,178
Int. Cl.[2] B60M 1/02
U.S. Cl. 297—216 18 Claims



1. An inertia-responsive vehicle seat back latch mechanism for a vehicle seat assembly having a seat cushion support, and a seat back pivotally supported for forwardly tilting movement, said latch mechanism comprising:
forwardly-inclined roller guide means adapted for attachment to the vehicle seat assembly for guiding a roller means;
roller means contained within said guide means for moving between a seat back locking position and a seat back tilting position, said roller guide means being adapted so that during a vehicle deceleration greater than a first predetermined value, the roller means is positioned in the seat back locking position; and
latching means adapted to be attached to the seat back assembly for direct engagement with said roller means when said roller means is in its seat back locking position to prevent said seat back from tilting forward.

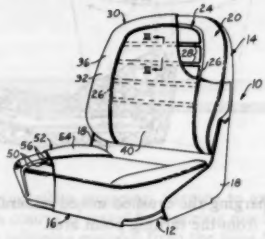
4,103,968
SEAT COVER

Max E. Butterfield, Peoria, and John Molnar, Aurora, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 9, 1977, Ser. No. 804,976
Int. Cl.[2] A47C 31/10
U.S. Cl. 297—219 2 Claims

1. A seat cover for a seat portion having in free form a

piurality of elongated depressions therein, comprising a seat cover body having in free form a plurality of of elongated ribs thereon, positioned to seat generally within respective depressions of the seat portion with the seat cover body fitted to the seat portion, said seat cover including means for removably securing said seat cover body to the seat portion, wherein said seat cover is readily removable from and readily positionable on the seat portion, said seat cover body having a generally smooth outer surface, and wherein the seat cover body includes a forward edge portion and a rearward edge portion,



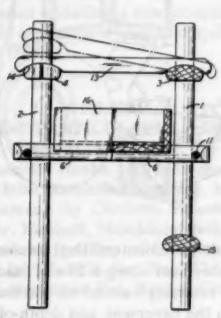
and further wherein said securing means comprises snap means mounted to the seat cover body adjacent the forward edge portion for securing the forward edge portion of the seat cover body to the seat portion, and said securing means also comprises generally hook-shaped means mounted to the seat cover body adjacent the rearward edge portion for securing the rearward edge portion of the seat cover body to the seat portion, wherein said hook-shaped means includes a continuous U-shaped channel substantially co-existent with the rearward edge portion of said seat cover body.

4,103,969

ADJUSTABLE WOODEN STUDIO BENCH

James Stoy Glessner, R.D. #2, Somerset, Pa. 15501

Filed Jun. 17, 1977, Ser. No. 807,353
Int. Cl.[2] A47C *3/28*
U.S. Cl. 297—311 **2 Claims**



1. An adjustable wooden studio bench comprising a pair of front legs spaced lengthwise of the bench, a horizontal top rail provided at its ends with vertical openings receiving the upper portions of said legs, a horizontal footrest rail provided at its ends with vertical openings receiving the lower portions of said legs, a back leg behind each front leg, a second horizontal top rail provided at its ends with vertical openings receiving the upper portions of said back legs, a cross bar at each end of the bench provided at its ends with vertical openings receiving the central portions of the adjoining front and back legs, each rail and bar having a vertical slot through each end extending from the opening therethrough out through the adjacent end to form a pair of horizontally spaced jaws, fastening means extending through each pair of jaws and drawing them toward each other to clamp the rails and bars at any desired height on the legs extending therethrough, and a seat resting on said top rails and slidable only lengthwise thereof the upper surfaces of said top rails being convex transversely of the rails, each of said surfaces forming a segment of a cylinder, and the bottom of said seat being provided with concave grooves receiving said convex surfaces, the wall surface of each groove forming a segment of a cylinder, all of said surfaces having substantially the same radius so that said wall surfaces fit said upper surfaces of the top rails when those rails are at the same level and also when one of them is lower than the other one to slant the seat whereby line contact between the seat and the top rails is avoided.

4,103,970

SEAT RECLINER

Robert I. Homier, Shelby, Ohio, assignor to Lear Siegler, Inc., Morristown, Tenn.

Filed Jan. 13, 1977, Ser. No. 758,898
Int. Cl.[2] B60N *1/02*
U.S. Cl. 297—363 **10 Claims**

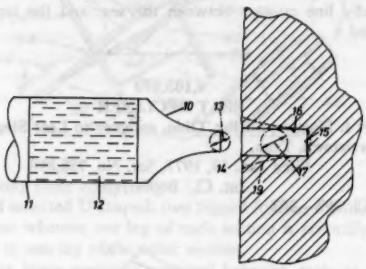
1. A seat recliner comprising: seat back and cushion arms having plate-like ends connected to each other for relative movement about a pivotal axis; a locking ring positioned between the ends of the arms encircling the pivotal axis and fixed to one of the arms; the locking ring having an opening therethrough and including inwardly extending locking teeth located within the opening in an arcuate shape about the pivotal axis; the other arm having spaced guides located within the opening of the locking ring; a locking dog received within the opening of the locking ring between the ends of the arms and having a plate-like construction that is slidably supported between the arm ends; the dog having a toothed end slidably supported between the spaced guides on the other arm for movement relative thereto toward and away from the ring teeth and also having an opening through which the pivotal axis extends; a cam received within the opening of the dog and movable about the pivotal axis to slidably move the dog; the cam being pivotal in one direction to slidably move the dog to a locking position where the toothed end thereof engages the ring teeth to prevent relative pivoting between the arms; the cam being pivotal in the opposite direction to slidably move the dog to a nonlocking position where the toothed end thereof is disengaged from the ring teeth and thereby allows pivotal adjusting movement between the arms; the opening of the dog including a locking surface located toward the toothed dog end from the pivotal axis and an unlocking surface located on the opposite side of the pivotal axis from the locking surface; the cam including a surface having a lobe that slidably engages the dog locking surface during the pivotal cam movement in the one direction to move the cam lobe into an overcenter relationship with the dog locking surface and the pivotal axis so as to maintain the dog in the locking position; the cam surface slidably engaging the unlocking surface during pivotal cam movement in the opposite direction to move the dog to the nonlocking position; and actuator means for pivoting the cam in opposite directions to move the dog between the locking and nonlocking positions.

4,103,971

METHOD FOR BREAKING ROCK BY DIRECTING HIGH VELOCITY JET INTO PRE-DRILLED BORE

Jean-Paul Denisart, Lutry; Barry E. Edney, and Chapman Young, both of Lausanne, all of Switzerland, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Aug. 31, 1976, Ser. No. 719,246
Claims priority, application Sweden, Sep. 19, 1975, 7510556
Int. Cl.[2] E21C *37/12*
U.S. Cl. 299—17 13 Claims



1. A method of breaking a hard compact material, such as rock, comprising:

mechanically drilling a substantially cylindrical blind hole in the material to be broken, said material having free surfaces adjacent said hole;

locating a nozzle outside of said hole and in alignment therewith, said nozzle having an internal cavity which has a converging contour leading to a nozzle exit area;

supplying a substantially incompressible fluid to said nozzle to generate a high velocity jet of said substantially incompressible fluid at said nozzle exit area, the smallest cross sectional dimension of said jet being between 30-100% of the free cross sectional diameter of said hole; and

directing said jet from said nozzle exit area in the axial direction of said hole toward the bottom of said hole so as to be suddenly arrested upon impact with said hole bottom to create a jet stagnation pressure in said hole to break said material toward adjacent free surfaces of said material.

4,103,972

OPEN PIT MINE

Boris J. Kochanowsky, c/o Synnestvedt & Lechner, 12 S. 12th St., Philadelphia, Pa. 19107

Continuation-in-part of Ser. No. 420,886, Dec. 3, 1973, Pat. No. 3,975,053. This application Jul. 15, 1976, Ser. No. 705,508
Int. Cl.[2] E21D *1/03;* E21F *13/00;* E21C *41/06*
U.S. Cl. 299—18 10 Claims

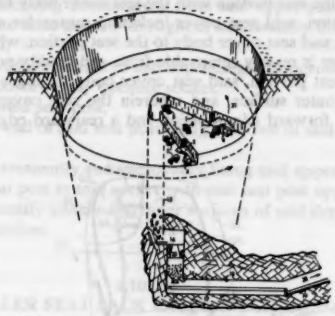
1. An open pit mine for the extraction of mineral materials from the earth's crust comprising:

a turning point area having a substantially horizontally level floor adapted to facilitate the operation of material-handling equipment and to receive crushed mined mineral material;

at least one bench moving on a downwardly sloping screw-shaped path extending radially outward from the turning point area;

a mobile crusher for crushing mined mineral materials located adjacent the bench;

a belt conveyor system for conveying crushed mined mineral materials from the crusher to the turning point area; and



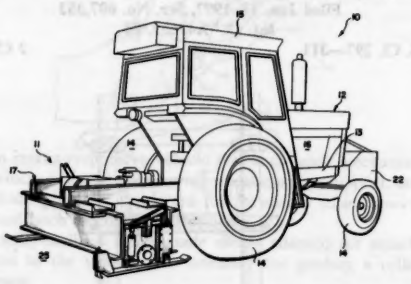
means for discharging the crushed mined mineral materials downwardly from the turning point area.

4,103,973

DEPTH CONTROL FOR ASPHALT PAVEMENT MILLING MACHINE

Earl F. Cutler, Lawrence, Kans., assignor to Cutler Repaving, Inc., Lawrence, Kans.

Filed Apr. 6, 1977, Ser. No. 785,308
Int. Cl.[2] E01C *23/12*
U.S. Cl. 299—39 20 Claims



1. An asphalt pavement milling machine having a frame adapted for movement along a line of machine travel, rotary milling means rotatably carried on the frame for milling engagement with the pavement, and depth-of-cut control means for locating the frame at a precise distance above the pavement to be milled so as to locate the rotary milling means relative to the pavement to provide a precise depth of cut, the depth-of-cut control means including depth control shoe means adapted to slide over the pavement, slide means connected to the shoe and carried for vertical sliding motion on the frame, rocker arms means pivotally connected to the slide means and to the main frame, and fluid power cylinder means having a cylinder body and a rod partially extensible from and retractable into the cylinder body, the cylinder means being pivoted to the main frame and to the rocker arm, cylinder rod movement relative to the cylinder body thus operating to rock the rocker arm means, slide the slide means, and raise and lower the shoe means relative to the frame.

4,103,974
CABLE CARRIAGE AND SPILL-PLATE HOUSING ASSEMBLY FOR A MINING MACHINE

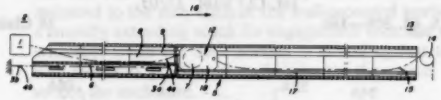
Georg Nowacki, Datteln, and Karl-Heinz Weber, Witten-Heven, both of Germany, assignors to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Germany

Filed Nov. 12, 1976, Ser. No. 741,338

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1975, 2550729

Int. Cl.² E21C *27/34*

U.S. Cl. 299—43 **10 Claims**



1. In a spill-plate apparatus adapted to extend along at one side of the course of travel by a mining machine having cutter means for releasing material from the mine face, the combination including:

a cable having an end connected to said mining machine while the cable extends along at one side of the course of travel by the mining machine,

a spill-plate housing defining an internal cable duct adapted to protectively enclose at least a portion of the extended length of said cable, said spill-plate housing having a slot along the length thereof to pass said cable for connection to said mining machine,

cover means normally closing that slot in said spill-plate housing while permitting the end of the cable to pass to the mining machine while moving along the course of travel,

a cable carriage protectively enclosed within said spill-plate housing for guided movement along said one side of the course of travel by the mining machine,

a pulley supported by said cable carriage for rotating about a horizontal axis, said cable being trained about said pulley to form a return cable loop which is guided and tensioned by said cable carriage, and

a tension reel means including a rope coupled to said cable carriage while extending within said spill-plate housing from one end thereof.

4,103,975
MINING MACHINE PARTICULARLY A DRUM-CUTTER MINING MACHINE

Wilhelm Funke; Heinrich Honke, both of Bochum, Fed. Rep. of Germany, and Heinz Simonides, deceased, late of Bochum, Fed. Rep. of Germany (by Charlotte Simonides, executrix), assignors to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Fed. Rep. of Germany

Filed Jul. 22, 1976, Ser. No. 707,534

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1975, 2532893

Int. Cl.² E21C *29/22*

U.S. Cl. 299—43 **10 Claims**

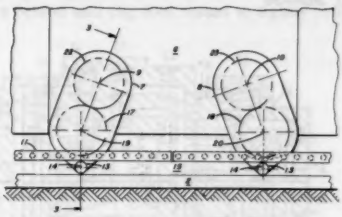
1. In combination with a mining machine having a winch for propelling the mining machine along a course of travel at the working face of the mine upon a face conveyor, each end of the mining machine including a pivotal support arm that carries a drum cutter to release coal from said working face for transportation by said face conveyor, an apparatus including the combination of:

wheel means coupled for rotation by said winch,

a sprocket wheel driven by said wheel means,

an elongated rack extending along said course of travel by the mining machine, said rack having teeth at spaced-apart locations at the top along the length thereof,

at least one support arm carried by said mining machine to pivot about a horizontal axis that extends at right angles to the course of travel by the mining machine, said support arm pivoting at one end thereof about said horizontal axis and said support arm positioning said sprocket wheel at the other end thereof to mesh with the teeth at the top of said rack by pivotal movement of the support arm about said horizontal axis, and



support means extending from said support arm beneath the teeth of said rack to position and maintain a meshed relation between said sprocket wheel and the teeth of said rack during the transmission of forces to the rack to propel the mining machine therealong.

4,103,976
TWO-PRESSURE BRAKE CONTROL VALVE FOR SINGLE STAGE RELEASING INDIRECTLY ACTING AIRBRAKES

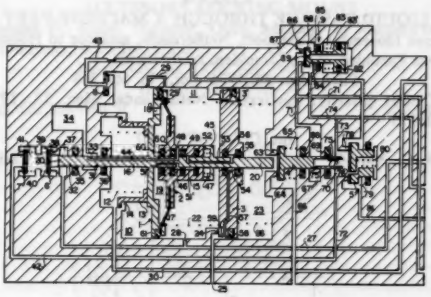
Peter Pick, Munich, Fed. Rep. of Germany, assignor to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 1, 1977, Ser. No. 820,705

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1976, 2634320

Int. Cl.² B60I *15/44*

U.S. Cl. 303—38 **12 Claims**



1. In a two-pressure brake control valve for a single stage releasing indirectly acting air brake for railway vehicles having a valve controlled by a main control element of a service brake portion in response to a decrease in pressure in the brake line per unit time below a predetermined value to subject a brake cylinder to the action of air from an auxiliary air reservoir, an emergency brake portion having a second main control element having an inactive position, means responsive to a decrease in pressure in the brake line per unit time exceeding the predetermined value for controlling a second valve by said second main control element to further subject the brake cylinder to the action of air from an emergency brake reservoir, an auxiliary control element on said second main control element, and a service brake acceleration valve in said emergency brake portion actuated by said auxiliary control element in response to variation of pressure in the brake line during a service braking operation when said second main control element is in an inactive position.

4,103,977

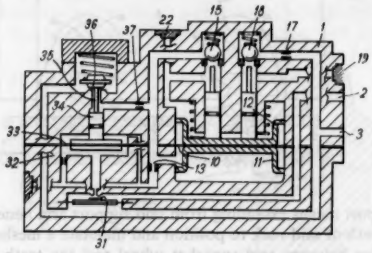
VEHICLE BRAKING CONTROL VALVE APPARATUS FOR QUICK SERVICE OPERATION

David John Wickham, London, England, assignor to Westinghouse Brake & Signal Co. Ltd., England

Continuation-in-part of Ser. No. 708,317, Jul. 26, 1976. This application Sep. 21, 1977, Ser. No. 835,191

Int. Cl.[2] B60T *15/42*

U.S. Cl. 303—38 8 Claims



1. A valve apparatus for improved quick service operation in a vehicle braking system, including a reference pressure signal input port and a brake pipe pressure signal input port, a pressure responsive member responsive to a pressure difference at said ports for permitting a fluid flow tending to equalize said pressure signals and means responsive to said fluid flow to produce a control pressure on a further pressure responsive member which controls one valve to assist a changing brake pipe pressure and another valve for modifying said control pressure to thereby reciprocate the said further pressure responsive member, said apparatus further comprising a relay valve operable in response to pressure built up due to said fluid flow to produce said control pressure.

4,103,978

LIQUID PASSAGE THROUGH A MACHINE-PART

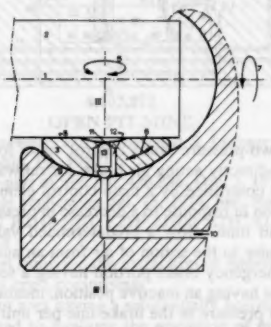
Simon Hoornstra, Sautpoort, Netherlands, assignor to Hoogovens Ijmuiden, B.V., IJmuiden, Netherlands

Filed Mar. 18, 1976, Ser. No. 668,264

Claims priority, application Netherlands, Mar. 13, 1975, 7503175

Int. Cl.[2] F16C *17/00*

U.S. Cl. 308—9 9 Claims



1. A machine part, in which a limited swingable motion can be carried out along a slide surface between a first element and a second element, means being provided for conducting a liquid from a point of the first element which is distant from the slide surface to a side of the second element which faces away from the slide surface, said means having channels or bore holes through both elements with a connecting passage on the slide surface between them, the bore hole in at least one of the two elements being widened at the connecting passage to form an elongated chamber in which there is arranged a body through which fluid flows and provided in the axial direction with bore holes, and axially under pressure semi-spherical head ends on said body resting in sealing manner against two ends of the chamber.

4,103,979

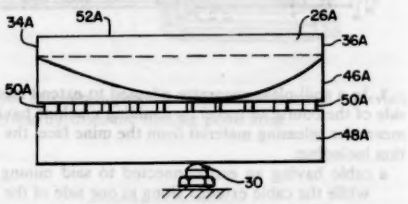
THRUST BEARING ASSEMBLY

Earl C. Kuhn, Penn Hills Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 720,333, Sep. 3, 1976, abandoned. This application Sep. 30, 1977, Ser. No. 838,441

Int. Cl.[2] F16C *17/03*

U.S. Cl. 308—160 18 Claims



1. An apparatus having a rotatable shaft with a thrust member affixed thereto, said shaft's axial displacement being restrained by a thrust bearing assembly, said thrust bearing assembly comprising:

a plurality of bearing pads disposed about said shaft with each pad having a first surface for engaging said thrust member, said first surfaces, when loaded, being deformable into substantially cylindrically crowned surfaces each with their axis extending in the radial direction;

means for providing an elastic foundation for each bearing pad's radial centerline, said elastic foundation being narrow in said circumferential direction and having variable elasticity in said radial direction such that said foundation deflects uniformly along said radial centerline when said bearing pads are subjected to operating loads; and

a plurality of stationary pivot members each of which is fixed in position and provides support for said elastic foundation means.

4,103,980

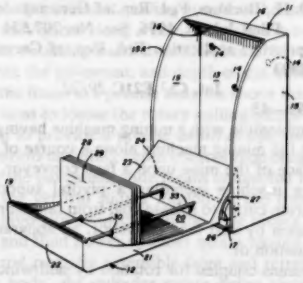
WALL-MOUNTED DIRECTORY

Patricia A. Silva, 2215 Aurora Dr., Pittsburgh, Pa. 15237

Filed Feb. 15, 1977, Ser. No. 768,766

Int. Cl.[2] A47B *63/00*; B42F *17/00*

U.S. Cl. 312—185 3 Claims



1. An enclosure which is adapted for mounting on a wall and suitable for use as a card directory, said enclosure comprising:

A. a wall-mounted portion and a desk portion,

(a) said wall-mounted portion having a back wall, two side walls and two end walls,

(b) said desk portion being pivotally mounted on the side walls of said wall-mounted portion at an end thereof and adapted to move from a closed position against the wall-mounted portion to an open position whereby the desk portion extends perpendicularly to the wall-mounted portion,

(c) the wall-mounted portion including a laterally extending and forwardly facing rib on an edge of the end wall opposite the end of the side wall to which the desk portion is pivotally mounted,

(d) the desk portion including along an edge thereof opposite the end at which the desk portion is pivotally mounted to the side walls of the wall-mounted portion a laterally extending notch for engagement with said rib whereby, when the desk portion is closed against the wall-mounted portion, the rib engages the notch to secure the enclosure,

(e) the desk portion also including a member having a triangular cross section forming a card rest and being pivotally mounted on a rod which extends from one side wall to the other of the wall-mounted portion through the card rest,

(f) each side wall of the wall-mounted portion having a flange on the opposed inside surfaces adjacent a front edge of the sidewall,

(g) said desk portion including a curved groove on each side of the member forming the card rest, each of said grooves having an open end and a closed end forming a stop, the flanges being adapted to fit within said grooves, the extent of travel of the desk portion in an arc toward and away from the wall-mounted portion being limited by the length of the grooves, the flanges engaging the stops formed by the ends of the grooves when the desk portion is in a position substantially perpendicular to the backwall of the wall-mounted portion and closing the open ends of the grooves when the desk portion is in its closed position against the wall-mounted portion, and

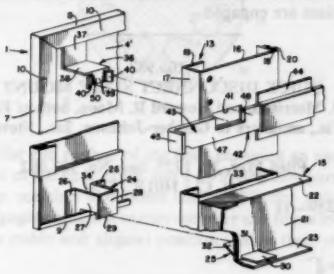
B. means on the desk portion for removably mounting a plurality of cards bearing indicia providing a directory or the like, said card mounting means comprising at least one rod extending from the front edge of the desk portion on which the notch is located to the other end of the desk portion where at the rod extends into the card rest for holding cards containing an opening through which the rod can extend for supporting the cards so that they are visible when the desk portion is in an open position and so that they are held during and upon closure of the desk portion against the wall-mounted portion.

4,103,981
REMOVABLE FURNITURE PANEL

Charles R. Donahue, and Leo Terlecki, both of Youngstown, Ohio, assignors to GF Business Equipment, Inc., Youngstown, Ohio

Filed Oct. 6, 1976, Ser. No. 730,278
Int. Cl.[2] A47B *43/00*
U.S. Cl. 312—257 A **6 Claims**

1. A furniture article including, a top, a frame assembly including a plurality of laterally spaced uprights engageable by said top and defining a drawer opening on the interior thereof, a vertical panel removably attached to the exterior of said frame assembly, said panel including a plurality of hanger members projecting inwardly from the lower portion of said panel, a plurality of retainer brackets extending outwardly from the lower portion of said frame assembly adapted to be engaged by said panel hanger members, a plurality of fixed clips projecting inwardly from the upper portion of said panel each including integral lock means having a rear surface spaced from said panel and disposed within the interior of said frame assembly when said panel hanger members engage said frame assembly retainer brackets and said panel is pivoted to juxtaposition said panel against the exterior of said frame assembly, at least a pair of said uprights each provided with a clip opening permitting passage of a pair of said panel clip lock means therethrough, a reciprocating latch member including a slide bar carried by at least a pair of said uprights and on the interior of said frame assembly and displaceable from an unlocked position allowing passage of said panel clip lock means into and out of the interior of said frame assembly through said upright clip openings, to a locked position whereby said slide bar engages behind said clip lock means to tightly retain said

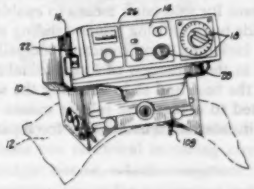


panel against the exterior of said frame assembly uprights, said slide bar having a notch therein alignable with one said clip opening when said slide bar is displaced to said unlocked position, a slidable drawer having a drawer front disposed within said drawer opening adjacent said latch member slide bar, and a handle on the forward end of said slide bar engageable by said drawer front when said slide bar is displaced to said unlocked position whereby, closing of said drawer produces engagement between said drawer front and handle and concurrent displacement of said slide bar to said locked position.

4,103,982
ACCESSORY LOCKING MOUNT

Edward H. Rudd, Wooster, Ohio, assignor to Magni-Power Company, Wooster, Ohio

Filed Nov. 16, 1976, Ser. No. 742,252
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—91 R **13 Claims**



1. A locking mount for attaching an accessory to a support member, comprising:

(a) a first bracket having sidewalls and a central, planar portion movable with respect to the sidewalls, the first bracket being rigidly affixed to the accessory at the sides of the accessory to embrace the accessory along three sides, the first bracket and the accessory being transportable as a unit;

(b) a second, box-like bracket rigidly affixed to the support member, the second bracket having sidewalls, the sidewalls adapted to be adjustable relative to each other and engage and slidably receive the sidewalls of the first bracket;

(c) adjustable mounting means for attaching the second bracket to the support member, the mounting means being disposed within the confines of the second bracket;

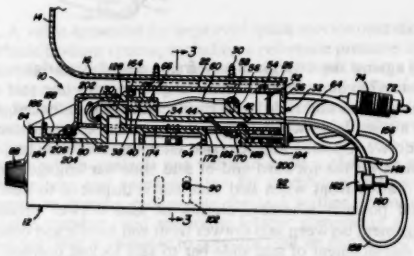
(d) a tab extending outwardly of the first bracket to serve as a finger grip;
(e) a plurality of stops affixed to the first bracket and adapted to engage the second bracket to limit relative movement of the first and second brackets;
(f) a locking device carried by one of the brackets and disposed substantially within the confines of the second bracket when the first and second brackets are engaged; and
(g) a plug-in electrical connector interconnecting the accessory and the vehicle and disposed substantially within the confines of the second bracket when the first and second brackets are engaged.

4,103,983

QUICK DISCONNECT SLIDE MOUNT

Lowell D. Morrison, and Howard R. Moon, both of Fort Atkinson, Wis., assignors to Gamber-Johnson, Inc., Stevens Point, Wis.

Filed Mar. 30, 1977, Ser. No. 783,082
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—91 R **12 Claims**



1. A slide mount for CB radios or other electrical or electronic equipment comprising: a base and a slide, one of which is adapted to be connected to a supporting structure and the other adapted to be connected with a CB radio, or the like, means releasably interconnecting said slide and base with said means being rendered effective and ineffective in response to relative sliding movement between the base and slide, latch means releasably locking the base and slide in interconnected relation by positively precluding relative sliding movement, and release means for said latch means to enable separation of the base and slide by permitting relative sliding movement, said release means including handle means manually actuated by exerting force in the direction of longitudinal relative movement between the base and slide whereby the same longitudinal force exerted to actuate the release means will move the base and slide in relation to each other for separating the base and slide.

4,103,984

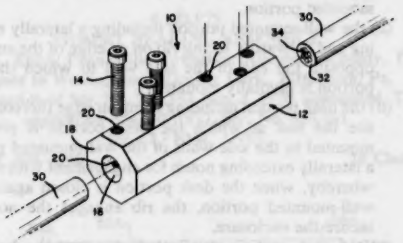
INSULATION DISPLACING PIN CONNECTOR

James Lenhart Mixon, Jr., Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 763,277, Jan. 27, 1977, abandoned. This application Feb. 6, 1978, Ser. No. 875,269
Int. Cl.[2] H01R *11/20*
U.S. Cl. 339—98 **1 Claim**

1. An insulation displacing pin connector for interconnecting two electrical cables, comprising:
a. a body member of conductive material having cable-receiving apertures at either end thereof;
b. a plurality of threaded bores positioned in the body member with three bores intersecting each aperture with two of the three being on one side of the aperture and the third being on the opposite side and longitudinally between the first two;
c. a plurality of conductive pins having a threaded shank with the free end of the shank being hollowed out to define a frontal cutting edge.

so that as the pins are threadedly advanced into a bore, the frontal cutting edge cuts through the insulation on a cable



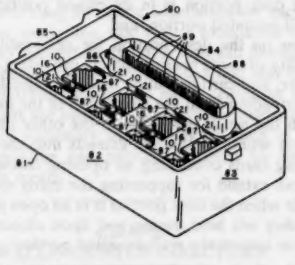
which may be positioned in the aperture and scrapes the edge of the underlying conductor and as the pins are further advanced, the threaded shanks electrically and mechanically engage peripherally the conductor on both sides thereof.

4,103,985

CONNECTOR ADAPTER CONSTRUCTIONS WITH IMPROVED CONNECTION AND CONNECTOR MOUNTING ARRANGEMENT

Ronald F. Krolak, North Riverside, and Frederick J. Radloff, Northlake, both of Ill., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Feb. 22, 1977, Ser. No. 770,805
Int. Cl.[2] H01R *11/08*; H02B *1/02*
U.S. Cl. 339—126 R **18 Claims**



1. A bridge adapter assembly for connecting selected conductors of a first multi-conductor cable to selected conductors of one or more second multi-conductor modular cables, each said second modular cable having at its end a first modular connector component, comprising:
an enclosure including a plurality of walls;
multiple contact connector means within said enclosure having a first predetermined plurality of contacts adapted to be coupled to the conductors of the first multi-conductor cable; and
at least one modular connector member disposed within said enclosure and arranged in a predetermined pattern relative to said multiple contact connector means, each of said connector members including means for releasably engaging one said first modular connector components and a second predetermined plurality of contacts less in number than said first predetermined plurality of contacts, and said contacts of each said modular connector member being electrically coupled to selected ones of said multiple contact connector means and adapted to be electrically coupled to the conductors of one of said second multi-conductor modular cables upon engagement of one said

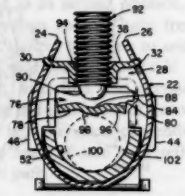
first modular connector component with said modular connector member.

4,103,986

ELECTRICAL TERMINAL

Hyman Izraeli, West Caldwell, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Sep. 12, 1977, Ser. No. 832,679
Int. Cl.[2] H01R *11/10*
U.S. Cl. 339—272 UC **17 Claims**



1. A terminating device comprising: a resilient generally annular prestressed split collar member having free ends each of which has an elongate transverse slot therethrough; a generally U-shaped bridge member seated tightly between said free ends to maintain said free ends in spaced apart relationship and to preload said collar member, said bridge member having a top portion and opposing leg portions, said leg portions extending from lateral edges of said top portion and straddling the sides of said collar member, said top portion having a generally centrally located threaded opening therethrough; a pressure screw threaded within said threaded opening in said bridge member and extending within the interior of said collar member; an arcuate saddle member seated against an inner surface of said collar member opposite said bridge member and having an outer surface having a radius of curvature generally equal to the radius of curvature of the adjacent portion of said inner surface of said collar member and seated intimately thereagainst, said saddle member having free ends each of which abuts a respective pair of free ends of said leg portions of said bridge member, said bridge member and said saddle member being held in abutting relationship by the stored energy in said preloaded collar member; and a pressure plate slidably disposed between said bridge member and said saddle member, said pressure plate being engageable by said pressure screw for movement towards said saddle member to provide a variable conductor receiving opening therebetween, the bowed sides of said collar member providing a reacting force against pressure exerted on said saddle member as said pressure plate is brought to bear against the portion of a conductor placed within said conductor receiving opening to compensate for the expansion and contraction of such portion by providing a relatively constant pressure thereagainst.

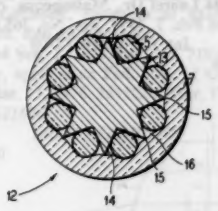
4,103,987

DEVICE FOR CONNECTING TWO GROUPS OF GLASS FIBERS

Ralf Kersten, Rottach-Egern, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 26, 1975, Ser. No. 635,276
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1974, 2456552
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.21 **11 Claims**

1. A connection between a first and second group of fibers with each group having the same number of fibers, each fiber in the first group being aligned with a given fiber in the second group, said connection comprising a single elongated carrier member having a plurality of longitudinally extending grooves with at least one groove for each fiber of the first group, each groove having a dimension and shape to receive a portion of a fiber disposed therein, said fibers of the first group being arranged with an end portion of each fiber extending into its respective groove from one end, the fibers of the second group being arranged with the end portion of each fiber extending into its respective groove from an opposite end of the groove



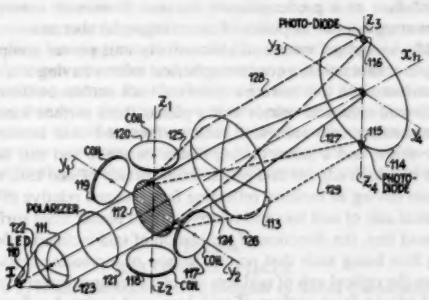
and with the end surface of the fiber engaging an end surface of the fiber of the first group, and a shrinking tube surrounding the carrier member and fibers disposed in the grooves and tightly engaging both the carrier member and fibers to hold the fibers in a stable and aligned position within their respective grooves.

4,103,988

ELECTRICALLY CONTROLLED OPTICAL SWITCH

Bernard Désormière, and Erich Spitz, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 7, 1976, Ser. No. 684,383
Claims priority, application France, May 13, 1975, 75 14873
Int. Cl.[2] G02B *5/18*
U.S. Cl. 350—162 R **5 Claims**



1. An electrically controlled optical switch for optically connecting at least one electrical incoming circuit to at least one electrical output circuit, which comprises:

at least one emitting means for generating under the control of said electrical incoming circuit a parallel polarized light beam;

a thin layer of transparent magnetic material exhibiting a magnetic remanence effect for diffracting by transmission said light beam into at least two diffracted beams;

means for magnetizing said thin layer in accordance with a grating of thin parallel bands oriented along a controllable direction; said magnetizing means being designed for acting under the control of short strong electrical current pulses, and said controllable direction being constant between two of said pulses without an applied bias magnetic field because of said remanence effect;

means for focusing said two diffracted beams on two spots situated onto a reference surface; and

at least one group of photo-electric means disposed onto said reference surface and connected to said electrical output circuit; said photo-electric means being excited by at least

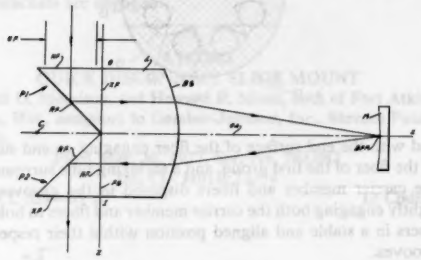
one of said spots for a given value of said controllable direction.

4,103,989

UNIT-POWER CONCENTRIC OPTICAL SYSTEMS

Seymour Rosin, 94 Laurel Dr., Massapequa, N.Y. 11762

Filed Feb. 7, 1977, Ser. No. 765,894
Int. Cl.[2] G02B 17/08
U.S. Cl. 350—199 27 Claims



1. A self-conjugate optical system of substantially unit power, comprising, in combination, a concave spherical mirror having a center of curvature; and a lens having a planar front surface coincident with said center of curvature and coincident with the image and object planes of the self-conjugate optical system and a spherical back surface intermediate said spherical mirror and said center of curvature and concentric with said spherical mirror, said spherical back surface and said spherical mirror being spaced apart a distance producing at said planar front face at a predetermined distance from said center of curvature a locus of points of zero tangential aberration.

10. An optical system of substantially unit power comprising, in combination, a concave spherical mirror having a center of curvature; a lens having a spherical back surface concentric with said spherical mirror and a planar front surface located intermediate said spherical back surface and said center of curvature; and a prism having planar entrance and exit faces one of which adjoins said planar front surface of said lens, said prism having an inclined reflecting face inclined relative to the optical axis of said lens and relative to said planar front surface of said lens, the direction of inclination of said inclined reflecting face being such that points thereon of increasing distance from the optical axis of said lens are of increasing distance from said planar front surface of said lens, said inclined reflecting face having an inner edge located at most slightly spaced from said planar front surface of said lens and at most slightly spaced from the optical axis of said lens, the dimensions of and the angles included by said faces of said prism being such that the travel distance through said prism from the entrance to the exit face thereof for rays passing through said planar front surface of said lens parallel to the optical axis is equal to the distance along the optical axis from said center of curvature to said planar front surface of said lens.

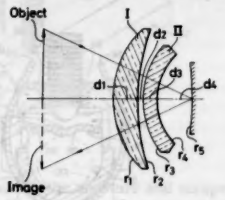
26. A self-conjugate optical system of substantially unit power comprising, in combination, a concave spherical mirror having a center of curvature; and a lens having a planar front surface coincident with said center of curvature and coincident with the image and object planes of the self-conjugate optical system and a spherical back surface intermediate said spherical mirror and said center of curvature and concentric with said spherical mirror, said spherical back surface and said spherical mirror being spaced apart a distance producing at said planar front face a tangential aberration which is zero at the optical axis of said lens, increases with increasing distance from the optical axis but then decreases with further increasing distance from the optical axis.

4,103,990

CATADIOPTRIC WIDE-ANGLE LENS SYSTEM FOR REPRODUCTION

Yu Yamada, Kokubunji, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1976, Ser. No. 739,041
Claims priority, application Japan, Nov. 7, 1975, 50-133676
Int. Cl.[2] G02B 17/08
U.S. Cl. 350—199 7 Claims



1. A catadioptric wide-angle lens system for reproduction comprising:

a positive meniscus lens with its convex surface directed toward an object and an image;

a negative meniscus lens being arranged axially behind said positive meniscus lens, with its convex surface directed to the object and the image, said negative meniscus lens made of dense flint glass, and satisfying the condition of $0.206F < r_3 < 0.239F$ in which r_3 is a radius of curvature of the front lens surface of said negative meniscus lens, wherein F is a focal length of said lens system; and

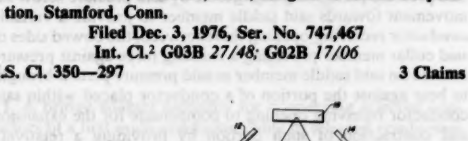
a concave mirror arranged axially behind said negative meniscus lens with its concave surface directed to the object and the image; the radius of a curvature of the front surface of said positive meniscus lens being larger than the radius of curvature of the front surface of said negative meniscus lens.

4,103,991

OPTICAL SYSTEM FOR SCANNING DURING RECIPROCAL MOTION PROVIDING 180° ROTATION OF IMAGE

Charles J. Kramer, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 3, 1976, Ser. No. 747,467
Int. Cl.[2] G03B 27/48; G02B 17/06
U.S. Cl. 350—297 3 Claims



1. An optical system for projecting an image of an object along an optical axis from an object plane to an image plane alternatively along a first alternate optical path and a second shunt optical path, said image being in a first orientation when projected along said first alternate optical path and in a second orientation, rotated 180° about the axis of propagation from said first orientation, when projected along said second shunt optical path, said system including:

a first reflector disposed on said optical axis and arcuately rotatable between a first position to deflect said optical axis along said first alternate optical path and a second position to deflect said optical axis along said second shunt optical path,

a second reflector disposed on said optical axis and arcuately

rotatable between a first position to deflect said first alternate optical path along said optical axis and a second position to deflect said second shunt optical path along said optical axis,

a roof reflector disposed in said first alternate optical path to receive light from said first reflector and deflect the same to said second reflector, said roof reflector having an apex extending in a first direction,

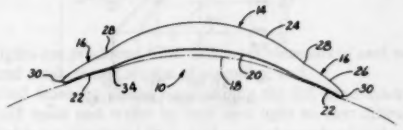
first and second fixed reflectors disposed on said second shunt optical path, said first fixed reflector disposed to receive light from said first rotatable reflector when the same is disposed in its second position, said second fixed reflector disposed to receive light from said first fixed reflector and to deflect the same to said second rotatable reflector when said second rotatable reflector is in its second position, said first and second fixed reflectors together forming the equivalent of a roof reflector with an apex extending in a direction perpendicular to said first direction of the apex of said roof reflector in said first alternate optical path.

4,103,992

CORNEAL CONTACT LENS AND METHOD OF MAKING THE SAME

Joseph L. Breger, Highland Park, Ill., and Joseph A. Stemmle, Thousand Oaks, Calif., assignors to Breger-Mueller Welt Corp., Chicago, Ill.

Filed Jan. 20, 1975, Ser. No. 542,576
Int. Cl.² G02C 7/04
U.S. Cl. 351—160 **4 Claims**



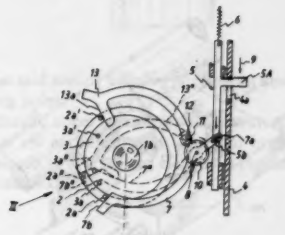
1. A structurally stable transparent corneal contact lens of generally concavo-convex form in cross section and having an outer diameter of about 7.0 to about 8.2 millimeters and sized to be fitted substantially within the limbus of the eye, the posterior side of the central portion of the lens having a curvature at least about one-half to six diopters steeper than the curvature of the cornea and the posterior side of the outer edge portion of the lens having a curvature such that it is substantially parallel to the curvature of the cornea, the outer edge portion of the lens being defined by the portion extending from the apex of the edge to a position located radially inwardly a distance of about 0.5 to about 0.7 millimeter, the thickness of the outer edge at said inward position being within the range of about 0.003 and 0.004 inch, the apex of said outer edge portion being between the center line of the outer edge portion and the posterior surface of the outer edge portion to enable flow of lacrimal fluid therebetween and to substantially reduce collision of the upper eyelid with the apex during closing of the eyelid, the center line of the outer edge portion being defined by a line running midway between the posterior and anterior surfaces thereof, the anterior surface of the outer edge portion having a gradual bevel extending to a point immediately adjacent the apex beyond which the anterior and posterior surfaces become increasingly curved toward one another to define the apex, the thickness of the outer edge portion at the point where the anterior and posterior surfaces begin to form the apex being within the range of about 0.0015 and 0.0025 inch and the surface area of the outer edge portion being at least about 30% of the combined surface areas of said central portion and said outer edge portion.

4,103,993

MOTION PICTURE CAMERA WITH VARIABLE FOCAL LENGTH LENS

Friedrich Winkler, Unterhaching; Anton Theer, Munich; Peter Lermann, Narring; Volkmar Stenzenberger, Unterhaching; Peter Griessner, Munich; Dieter Sandl, Ottobrunn; Hermann Müller, Munich, and Herbert Wilsch, Unterhaching, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, AG, Leverkusen, Fed. Rep. of Germany

Filed Sep. 2, 1976, Ser. No. 719,956
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1975, 2540460; Mar. 17, 1976, 2611230; Mar. 17, 1976, 2611229; May 14, 1976, 2621626
Int. Cl.² G03B 3/00
U.S. Cl. 352—140 **56 Claims**



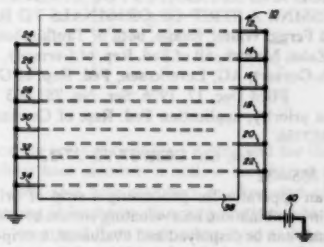
1. In a photographic apparatus, particularly in a motion picture camera, a combination comprising a variable focal length lens; means for adjusting the focal length of said lens, said adjusting means being movable between a plurality of positions including at least one neutral position corresponding to a predetermined focal length; at least one additional adjusting means movable between a plurality of positions including at least one neutral position, said additional adjusting means including focusing means for said lens; actuating means movable between operative and inoperative positions; and motion transmitting means for simultaneously moving both said adjusting means to the respective neutral positions in response to movement of said actuating means between said operative and inoperative positions, irrespective of the position of either of said adjusting means prior to such movement of said actuating means.

4,103,994

RECORDING PLATE

Lloyd F. Bean, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 11, 1977, Ser. No. 767,706
Int. Cl.² G03G 15/00
U.S. Cl. 355—3 R **12 Claims**



1. An image recording member, including:

a support member;

a photoconductive layer contiguous with said support member;

at least a pair of conductive members embedded in said photoconductive layer with each of said conductive members being spaced from one another and having an insulating coating thereon for electrical isolation thereof; and

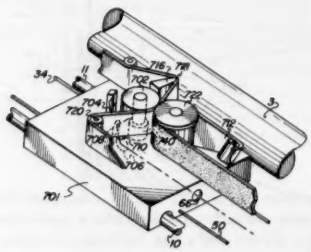
means for generating an electrical potential difference between said pair of conductive members so as to form an electrical field in said photoconductive layer.

4,103,995

IMAGING APPARATUS

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 18, 1975, Ser. No. 569,339
Int. Cl.² G03G *15/00*
U.S. Cl. 355—14 **48 Claims**



1. Imaging apparatus comprising:

(a) an elongate platen for supporting a receiving medium;

(b) a print head mounted for advancement along the length of said platen and adjacent the surface thereof; said print head including means for handling an intermediate surface and means for handling marking material for forming an image of marking material on the intermediate surface, and means to transfer the marking material image formed on the intermediate surface to the receiving medium supported by said platen;

(c) additional imaging means cooperating with said print head to produce a marking material image at said print head;

(d) means to advance said print head along the length of said platen; and

(e) control logic circuitry to control said means to advance said print head and said means to transfer the marking material image to the receiving medium and coordinate the operation of said means to advance and said means to transfer, whereby marking material images may be transferred to a pre-determined position on the receiving medium.

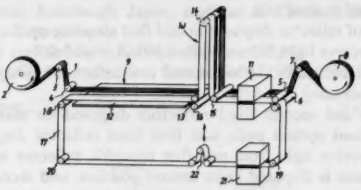
4,103,996

METHOD AND APPARATUS FOR EVALUATING AND PROCESSING A STRIP OF ORIGINALS TO BE COPIED

Berthold Fergg; Walter Knapp, both of Taufkirchen, and Wolfgang Zahn, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, AG, Leverkusen, Fed. Rep. of Germany

Filed Dec. 17, 1976, Ser. No. 751,603
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1975, 2557756
Int. Cl.² G03B *27/32, 27/52*
U.S. Cl. 355—32 **12 Claims**

1. In an apparatus for processing a strip of originals to be copied, in combination, an evaluating station at which the strip of originals can be displayed and evaluated, a strip-shaped first information carrier upon which information indicative of the evaluations can be entered, means for transporting the strip of originals and the first information carrier parallel to and in step with each other away from the evaluating station along a predetermined path, and a reading and encoding station located downstream of the evaluating station operative for reading the information on the first carrier and transferring that information in encoded form onto a second information carrier



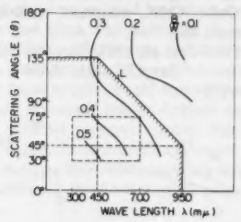
in an arrangement coordinated with the corresponding ones of the originals of the strip of originals.

4,103,997

LIGHT SCATTERING TYPE SMOKE DETECTOR

Tsunehiko Araki, Takarazuka, and Yoshihiko Okuda, Izumi, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jul. 7, 1976, Ser. No. 703,201
Claims priority, application Japan, Jul. 15, 1975, 50-86793
Int. Cl.² G01N *21/00, 21/26*
U.S. Cl. 356—104 **5 Claims**



1. In a smoke detector of the light scattering type for actuating a warning device and comprising a housing containing a light source for emitting incident light having a wave length λ, a light receiving element, and a smoke collecting region so arranged that incident light from said source which contacts a smoke particle in said region is scattered such that the scattered light directed toward said receiving element forms an angle θ with the direction of the incident light, the ratio of the intensity I_s of the scattered light to the intensity I_o of the incident light defining an intensity ratio I_s/I_o for the smoke; the ratio of the intensity ratio for a black smoke to the intensity ratio for a white smoke defining the sensitivity ratio of the detector; the improvement wherein said wave length λ and said angle θ each bear a relationship to the intensity ratio and are determined as a function of one another within the limits $\lambda \leqq 950$ mμ when $\theta \leqq 45°$, $\theta \leqq -0.18\lambda + 216$ when $45° \leqq \theta \leqq 135°$, and $\theta \leqq 135°$ when $\lambda = 450$ mμ, to define a preselected range of sensitivity ratios for the detector.

4,103,998

AUTOMATIC ALIGNMENT APPARATUS

Kiwao Nakazawa, Tokyo, and Akikazu Tanimoto, Kawasaki, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jul. 19, 1976, Ser. No. 706,292
Claims priority, application Japan, Jul. 21, 1975, 50-88398
Int. Cl.² G01B *11/26*
U.S. Cl. 356—152 **11 Claims**

1. An alignment apparatus for photoelectrically detecting X- and Y-direction position signals of a wafer and a mask each having thereon right-hand and left-hand reference marks and

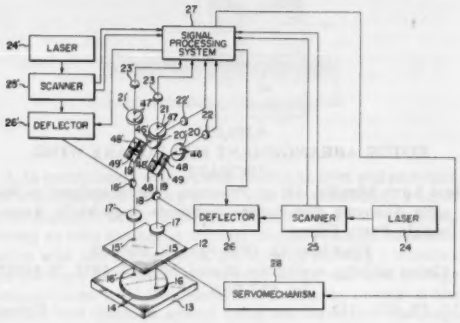
for aligning the wafer and the mask in a predetermined positional relationship by the use of said signals, comprising:

reference marks formed at the right-hand and left-hand sides of each of said wafer and said mask, each of said reference marks comprising two mark elements extending in two different directions, said reference marks being formed such that when said mask and wafer are overlapped with each other, diffracted lights in different directions are produced from adjacent ones of said mark elements on said mask and wafer;

a first source of coherent light for illuminating the right-hand marks on said mask and wafer with a coherent spot light;

a second source of coherent light for illuminating the left-hand marks on said mask and wafer with a coherent spot light;

first scanning means for scanning the right-hand marks on said mask and wafer by said spot light so that diffracted



lights are produced from said mark elements of said wafer and mask in one stroke of scanning; and

second scanning means for scanning the left-hand marks on said mask and wafer by said spot light so that diffracted lights are produced from said mark elements of said wafer and mask in one stroke of scanning;

first, second, third and fourth detector means for respectively detecting the diffracted lights in one direction and the diffracted lights in the other direction produced from the right-hand marks on said wafer and mask and the diffracted lights in one direction and the diffracted lights in the other direction produced from the left-hand marks on said wafer and mask, and for photoelectrically converting said diffracted lights respectively;

whereby wafer position signals and mask position signals for the alignment of said wafer and mask may be separately produced by said first, second, thrid and fourth detector means.

4,103,999

RUPTURABLE SEALING ELEMENT WITHIN AN INK RESERVOIR CARTRIDGE

Gerold Anderka, Ellerbek, Fed. Rep. of Germany, assignor to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed Dec. 14, 1976, Ser. No. 750,497

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1975, 2559294

Int. Cl.[2] B43K *23/02*

U.S. Cl. 401—134 **1 Claim**

1. In a capillary writing pen of the type having a scribing point, a tubular shaped ink reservoir cartridge, further including:

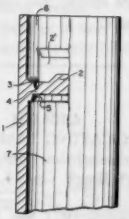
A. An open ended elongated chamber having a filling end and an ink flowing end;

B. A reservoir defined in said filling end and including an inwardly turned circular rib;

C. A rupturable reduced thickness sealing element for said ink flowing end, said sealing element being further defined by;

i. a transverse petition within said elongated chamber and adjacent said inwardly turned circuit rib and,

ii. a circular exterior notch defining a preset rupturing



point as said sealing element engages an inner end of the scribing point;

iii. an enlarged upper end axially offset with respect to said circular rib and engagable with said inwardly turned circular rib, as said sealing element is ruptured and so as to permit ink flow.

4,104,000

ARRANGEMENT FOR SUPPORTING A RAILING AND THE LIKE

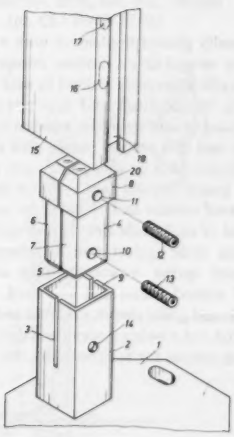
Horst Fleischmann, Munich, Fed. Rep. of Germany, assignor to Gebrüder Kömmerling Kunststoffwerke GmbH, Pirmasens, Fed. Rep. of Germany

Filed Apr. 22, 1977, Ser. No. 790,138

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1976, 2618442

Int. Cl.[2] F16B *7/00*

U.S. Cl. 403—7 **14 Claims**



1. A supporting arrangement for a railing and the like, comprising a hollow base member; a hollow bar-shaped member telescopable over said base member; an elongated clamping element including at least two clamping portions which are at least partially separated from each other over a plane extending in a direction of elongation of said clamping element and movable relative to each other in a direction substantially transverse to said direction of elongation of said clamping element, said clamping portions having first sections insertable in and engageable with said base member, and second sections projecting outwardly beyond said base member as well as

insertable in and engageable with said bar-shaped member; and means for spreading apart said clamping portions of said clamping element in said transverse direction so that said first sections of said clamping portions are spread apart and thereby spread said base member into clamping engagement with said bar-shaped member, whereas said second sections of said clamping portions are spread into clamping engagement with said bar-shaped member.

4,104,001

RECIPROCATING TAMPING TOOL

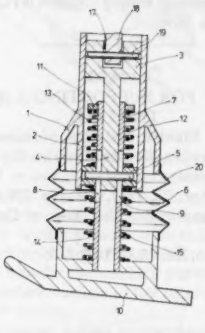
Philip Uebel, Unterschleissheim, Lohhof, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 5, 1977, Ser. No. 857,767

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1977, 2702577

Int. Cl.[2] E01C *19/30*

U.S. Cl. 404—133 **9 Claims**



1. A manually guided implement with a tool performing a reciprocating up-and-down motion, comprising a cylinder; a first piston axially movably guided in said cylinder; a second piston axially spaced from said first piston and also axially movably guided in said cylinder; a piston rod rigidly connecting said first and said second piston with each other; a guide sleeve axially movable on said piston rod, projecting through said second piston beyond said cylinder and carrying on the free end thereof outside said cylinder the tool; an abutment on the other end of said guide sleeve; first spring means abutting with opposite ends against said abutment and said second piston; second spring means abutting with opposite ends against said second piston and said tool, said spring means forming with said guide sleeve, said first and said second piston and said piston rod a swing system; and drive means connected to said swing system for reciprocating the same in said cylinder.

4,104,002

SPIRAL STRIP ACOUSTIC TREATMENT

Frederic Franklin Ehrich, Marblehead, Mass., assignor to General Electric Company, Lynn, Mass.

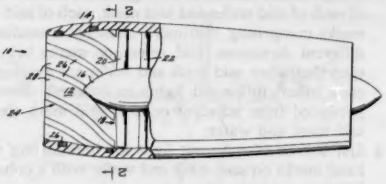
Filed Dec. 2, 1976, Ser. No. 746,975

Int. Cl.[2] F04D *29/66*

U.S. Cl. 415—119 **7 Claims**

1. An acoustic duct for transmitting and absorbing acoustic pressure fields characterized by spinning modes comprising

a longitudinally extending rigid duct having attached to the inner surface thereof a set of at least several circumferentially spaced, strips of sound-absorbing material which extend helically about the longitudinal axis of the duct,



said set of peripherally spaced strips being effective to achieve scattering of the spinning mode acoustic pressure fields for improved sound suppression.

4,104,003

ROTOR ARRANGEMENT FOR ROTARY WING AIRCRAFT

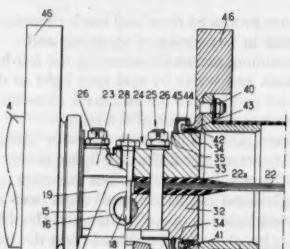
René Louis Mouille, Aix en Provence, France, assignor to Societe Anonyme dite Societe Nationale Industrielle Aerospatiale, Paris, France

Filed May 14, 1976, Ser. No. 686,638

Claims priority, application France, May 14, 1975, 75 14987

Int. Cl.[2] B64C *27/38*

U.S. Cl. 416—141 **6 Claims**

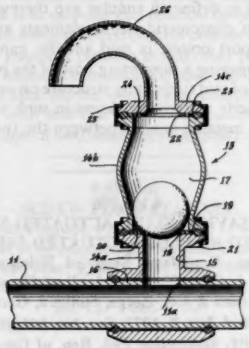


1. A rotor head assembly for rotary wing aircraft, comprising: a rotor hub having a two pronged fork; a pair of blades disposed on opposite sides of said hub; a one-piece, flexible, twistable beam connecting said blades; a shaft means rotatably mounted between the prongs of said fork and extending transversely to the longitudinal axis of said blades and intersecting the axis of rotation of said rotor hub, said shaft means having a mounting plate disposed between said prongs and arranged to receive the median part of said beam, said mounting plate having a recess disposed transversely to said shaft means, said recess housing said median part of said beam; cap means enclosing said median part within said recess; said beam being pivotably mounted for pivoting about the axis of rotation of said shaft means.

4,104,004
AIR ELIMINATOR FOR PUMPS

Myron Lee Graef, Hebron, Ill., assignor to The De Laval Separator Company, Poughkeepsie, N.Y.

Filed Nov. 12, 1976, Ser. No. 741,300
Int. Cl.[2] F04B *21/00*
U.S. Cl. 417—313 4 Claims



1. In combination with a pump having an inlet and an outlet, and a suction pipe leading to said inlet for conducting a liquid to be pumped, an air eliminator comprising a valve housing having an inlet passage at one end thereof in sealed communication with said suction pipe, the housing defining a chamber and having a first valve seat through which said inlet passage communicates with the chamber, the housing having at the opposite end thereof a second valve seat forming a discharge opening leading to atmosphere, said chamber forming a main passage which increases and then decreases in cross-sectional area from said first valve seat toward said second valve seat, a ball valve in said chamber adapted to seat alternately on the valve seats, the ball valve being normally seated only on said first valve seat to prevent entrance of air into the suction pipe but being displaceable from the first seat to allow discharge of air under pressure from the suction pipe through said second valve seat while suspended by the force of the discharging air, the ball valve having a specific gravity less than that of said liquid, whereby liquid entering the chamber from the suction pipe floats the ball valve against said second seat to prevent discharge of liquid from the chamber, the housing including a first section forming said inlet passage and a second section separable from the first section and forming said chamber, a compressible gasket inserted between said first and second sections and forming said first valve seat, and releasable means located outside the housing for clamping said sections together to compress said gasket.

4,104,005
PNEUMATIC BLADDER PUMP HAVING STIFFNESS SYMMETRY

Victor L. Poirier, Chelmsford, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed Jan. 9, 1976, Ser. No. 647,842
Int. Cl.[2] F04B *43/08, 43/10, 45/06*
U.S. Cl. 417—394 8 Claims

7. A blood pump comprising:

a flexible axis-symmetrical bladder having a midsection, a first end section defining a first port and a second end section defining a second port smaller in diameter than said first port;

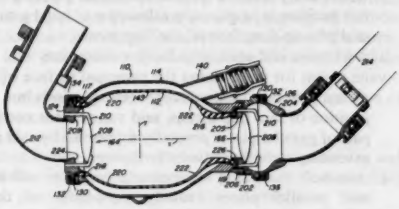
means associated with said bladder for producing substantially equal stiffness at all points on said bladder equidistant from a plane perpendicular to its axis of symmetry and located substantially at the center of said midsection, for maximizing collapse during external pressurization, said means for producing having at least an annular stiffening means associated with the wall of said second end section;

peripheral means around each of said first and second ports;

a rigid housing enclosing said bladder;

means in said housing forming an opening coinciding with each of said first and second ports for sealing engagement with each said peripheral means;

means forming a third opening in said housing for introducing compressed gas between said bladder and said housing;



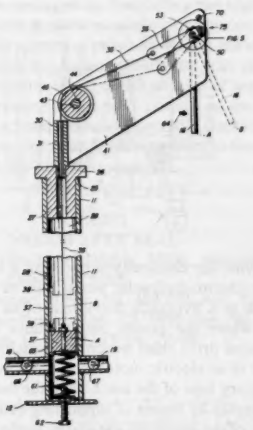
a pair of end adaptor means having passageways for conducting blood to and from said bladder, one adaptor means being located at each of said first and second ports for sealing engagement with the associated peripheral means; and

means for holding each said adaptor means in sealing engagement with the corresponding said peripheral means and each said peripheral means in sealing engagement with said housing.

4,104,006
WIND-ENERGY CONVERSION DEVICE

Shmuel Meiri, Skokie, Ill., assignor to Northwestern University, Evanston, Ill.

Filed Jan. 10, 1977, Ser. No. 758,086
Int. Cl.[2] F04B *17/02*
U.S. Cl. 417—334 7 Claims



1. Apparatus for transducing gusts of wind into reciprocal motion, said apparatus comprising

support means comprising a vertically extending mast,

a rotatable axle supported by said mast,

flap means affixed to said axle and including a principal surface extending radially outwardly thereof in a single direction, said flap means being pivotable leewardly with said axle in response to gusts of wind striking said principal surface,

shaft means having a proximal end coupled to said axle and a distal end connected to tension-producing spring means, and

coupling means intercoupling the proximal end of said shaft means to said axle and comprising an inflexible torque arm attached to said axle and extending radially outwardly thereof,

whereby said shaft means is pulled proximally in response to gusts of wind displacing the principal surface of said flap means from a first, rest position to a second, displaced position; and said spring means pivots said flap means windwardly from a second, displaced position to a first, rest position in response to relaxation of wind gusts against said principal surface of the flap means;

and wherein said apparatus further comprises

vane means for maintaining the principal surface of said flap means generally normal to prevailing winds in a first rest position of said flap means, said vane means comprising a pair of parallel plates pivotally supported by said mast and extending radially outwardly thereof, and

a cross-bolt extending horizontally between and adjoining said parallel plates radially outwardly of the mast, wherein said torque arm is adapted to abut against said cross-bolt in response to extremely strong gusts of wind directed against the principal surface of said flap means, whereby said cross-bolt limits pivotal rotation of said axle to preclude coiling of said flexible cable around said axle in extremely gusty winds.

4,104,007

ELASTIC SUPPORT FOR HYDRAULIC PUMP OF INJECTION MOLDING

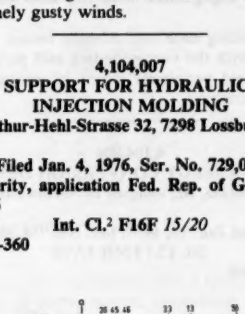
Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg, Fed. Rep. of Germany

Filed Jan. 4, 1976, Ser. No. 729,035

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1975, 2544536

Int. Cl.² F16F *15/20*

U.S. Cl. 417—360 **8 Claims**



1. A device for elastically supporting a hydraulic pump as part of an electro-hydraulic pump unit of a production machine, such as a hydraulic drive unit of an injection molding machine, where the power unit includes a hydraulic pump with a central drive shaft which is coaxially coupled with the drive shaft of an electric motor, and the power unit is mounted on a stationary base of the machine in the manner of a self-contained assembly by means of supporting members which carry the weight of the assembly; the elastic pump supporting device comprising in combination:

a pump supporting structure extending axially forwardly from the electric motor to the pump, on opposite sides of the unit center axis defined by said coupled drive shafts, the pump supporting structure being rigid and solidary with the electric motor and including a plurality of strut rods reaching forwardly at least far enough to intersect a radial plane through the centroid of the hydraulic pump;

a plurality of pump support points defined by the pump supporting structure in the vicinity of said radial centroid plane, said support points being spaced around the pump centroid;

the pump includes a pump body portion having axial supporting bores in alignment with said pump support points;

each strut rod is aligned with a pump support point, extending forwardly through the associated supporting bore of the pump body, but with a smaller diameter than said bore, so as to define an annular gap therewith; and

a plurality of elastomeric sleeve elements arranged at the pump support points, in said annular gaps, each sleeve element engaging a supporting bore of the pump body and a strut rod of said supporting structure on opposite sides of an elastomeric material thickness in such a configuration that direct metallic contact between the two structures is precluded.

4,104,008

PUMP HAVING FLUID-ACTUATED MOTOR CONTROLLED BY FLUID-ACTUATED DISTRIBUTOR

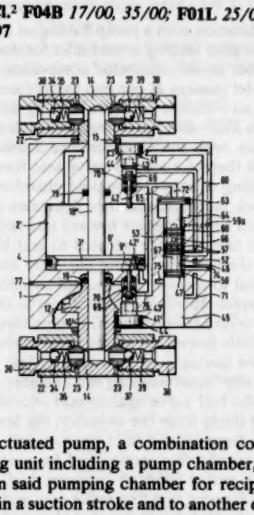
Ernst Hoffmann, Braunlage; Siegfried Reimann, and Heinz Aschermann, both of Walkenried, all of Germany, assignors to Schmidt Kranz & Co., Zorge, Sudharz, Germany

Filed Jun. 9, 1977, Ser. No. 805,077

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1976, 2626954

Int. Cl.² F04B *17/00, 35/00;* F01L *25/06*

U.S. Cl. 417—397 **18 Claims**



1. In a fluid-actuated pump, a combination comprising at least one pumping unit including a pump chamber, a pumping piston received in said pumping chamber for reciprocation to one end position in a suction stroke and to another end position in a pumping stroke, and means for admitting a medium to be pumped into said pumping chamber during said suction stroke and for discharging the medium being pumped from said pumping chamber during said pumping stroke; an actuating unit including an actuating chamber and an actuating piston subdividing said actuating chamber into two actuating compartments and connected to said pumping piston for joint reciprocation; a source of pressurized actuating fluid; a sink for the actuating fluid; and means for alternately communicating at least one of said actuating compartments with said source and said sink, including a main valve having a control chamber and an elongated main valve member mounted in said control chamber for movement between an extended and a retracted position and having a larger first end face facing a first, and a smaller second face facing a second, control compartment into which said main valve member subdivides said control chamber, and a first and second connecting compartment at the circumference of said main valve member intermediate said end faces and separate from each other and from said control compartments, said communicating means further including first duct means permanently communicating said second connecting and control compartments with said source for the

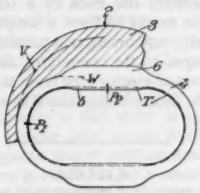
pressurized actuating fluid to urge said main valve member toward said extended position thereof, second duct means communicating said first connecting compartment with said sink, third duct means communicating said source with said first control compartment, an auxiliary valve member interposed in said third duct means for displacement from a closed toward an open position, means for displacing said auxiliary valve member toward said open position thereof when said pumping piston is at said one end position thereof, fourth duct means communicating said first control compartment with said sink when said pumping piston is at said other position thereof, and fifth duct means communicating said one actuating compartment with said second connecting compartment in said retracted, and with said first connecting compartment in said extended, position of said main valve member.

4,104,009

SCREW PUMP STATORS

Edmond Chanton, Clamart, France, assignor to Societe Generale de Mecanique et de Metallurgie, Vanves, France

Filed Mar. 4, 1977, Ser. No. 774,650
Claims priority, application France, Mar. 9, 1976, 76 06736
Int. Cl.[2] F04C 1/02
U.S. Cl. 418—48 **5 Claims**



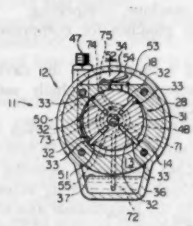
1. A screw pump stator comprising a rigid tubular body lined on the inside with a resilient sleeve, characterised in that its resilient sleeve(4) is formed by a twisted liner whose thickness varies along the periphery of each transverse section, this thickness being the highest in the zones corresponding to the highest sliding speeds of the rotor, these thickened zones forming bosses (5,6) both on the outside surface and on the inside surface of this liner, and in that its rigid body (3) has an inside surface of generally the same form as that of the inside surface of the twisted liner, but hollowed out at the level of the bosses of this liner so as to receive sealingly the outside bosses of this latter.

4,104,010

ROTARY COMPRESSOR COMPRISING IMPROVED ROTOR LUBRICATION SYSTEM

Tsunenori Shibuya, Konan, Japan, assignor to Diesel Kiki Co. Ltd., Tokyo, Japan

Filed Aug. 17, 1976, Ser. No. 715,025
Claims priority, application Japan, Aug. 18, 1975, 50-113520[U]
Int. Cl.[2] F04C 29/02
U.S. Cl. 418—76 **2 Claims**



1. A rotary compressor comprising:

a housing formed with a bore and having end plates and an end cover;

a rotor comprising a rotor body and a shaft fixed to the rotor body, the rotor body being operatively disposed in the bore and being formed with a plurality of substantially radial slots, the shaft extending through the end cover;

a bearing mounted in an opening through one of the end plates and rotatably supporting the shaft;

a plurality of vanes slidably retained in the slots respectively for sealing engagement with an inner wall of the housing defining the bore thereby partitioning the bore into a plurality of fluid chambers, the rotor being disposed in the bore in such a manner that upon rotation thereof the fluid chambers increase in volume in an inlet portion of the bore and decrease in volume in an outlet portion of the bore;

a fluid inlet passageway opening into the inlet portion of the bore;

a fluid outlet passageway opening from the outlet portion of the bore;

an oil reservoir in said housing;

a communicating passageway between the oil reservoir and the fluid outlet passageway such that the fluid in the fluid outlet passageway pressurizes the oil reservoir;

a substantially semi-annular high pressure oil chamber formed in the housing and communicating with the slots of the rotor radially inwardly of the vanes in the outlet portion of the bore;

an interconnecting passageway between the high pressure oil chamber and the oil reservoir;

a substantially semi-annular low pressure oil chamber formed in the housing and communicating with the slots of the rotor radially inwardly of the vanes in the inlet portion of the bore;

a conducting passageway between the low pressure oil chamber and the fluid inlet passageway providing for flow of oil through the conducting passageway to the inlet portion of the bore, the bearing being located in the conducting passageway such that oil passing from the low pressure oil chamber to the fluid inlet passageway passes through the bearing to lubricate the latter, the conducting passageway being further formed by an oil chamber in the end cover disposed about the shaft; and

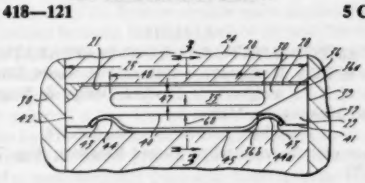
a flow restriction passageway connecting the high pressure oil chamber with the low pressure oil chamber in such a manner that the vanes are pressed by oil in the slots of the rotor into sealing engagement with the wall of the bore with a high pressure in the outlet portion of the bore and with a low pressure in the inlet portion of the bore, the high and low pressure oil chambers and the flow restriction passageway being formed as grooves in the end plate which mounts the bearing.

4,104,011

I-BEAM APEX SEAL

Robert P. Ernest, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 458,378, Apr. 5, 1974, abandoned. This application Dec. 27, 1976, Ser. No. 754,662
Int. Cl.[2] F01C 19/04, 21/08
U.S. Cl. 418—121 **5 Claims**



1. In a rotary internal combustion engine having a rotor with slots and gas communicating channels, said slots having flat leading and trailing side walls arranged in a generally radial

direction with respect to the rotor center of rotation, and having a predetermined width, length and depth, each communicating channel extending between the rotor outer surface and an interior location of one of said slots, an apex seal comprising:

(a) a crown portion extending out of said slot,

(b) a unitary impervious body portion residing within said slot having leading and trailing side walls carrying grooves extending at least 80% the length of said body portion and extending into the body portion a depth at least 33% of the width of said body portion, and extending a height sufficient to leave an uninterrupted residual side wall surface below said groove which is substantially about 0.04 inch, and

(c) means providing length adjustment of said seal in conformity with any variance of the spacing between ends of said rotor slots.

4,104,012

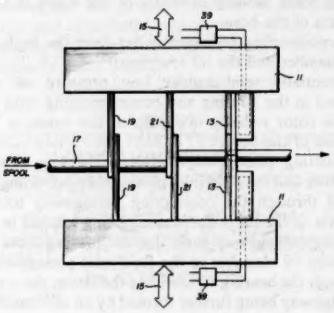
IMPROVED WIRE STRIPPING APPARATUS

Michael R. Ferrante, 9820 S. 50th Ct., Oak Lawn, Ill. 60453

Filed Oct. 12, 1976, Ser. No. 731,138

Int. Cl.[2] M02G *1/12*; B29C *17/08*

U.S. Cl. 425—299 **8 Claims**



1. In a wire stripping apparatus having means for removing the insulation from the end of the electrical conductor of an insulated wire to expose a predetermined length of said electrical conductor, the improvement comprising:

means for compressing a predetermined length of said insulation remaining on said electrical conductor immediately adjacent said exposed electrical conductor to secure the predetermined length of said remaining insulation in position on said electrical conductor; and

means for simultaneously heating said compressed remaining insulation immediately adjacent said exposed electrical conductor,

said compressing means and said heating means cooperating to cause said adjacent remaining insulation to adhere to said electrical conductor along said predetermined length of remaining insulation.

4,104,013

TAMPON EJECTOR TUBE AND APPARATUS

Eugene R. Kelly, Hauppauge, and Donald M. Gould, Glen Cove, both of N.Y., assignors to Product Design & Engineering Corp., Minneapolis, Minn.

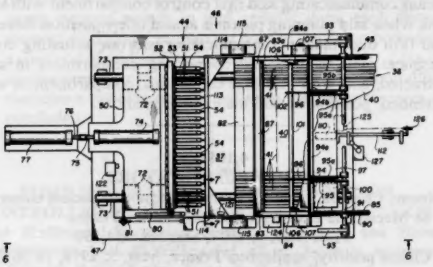
Filed Feb. 2, 1976, Ser. No. 654,378

Claims priority, application United Kingdom, Aug. 7, 1975, 28706/75

Int. Cl.[2] B29C *17/00*

U.S. Cl. 425—324.1 **11 Claims**

1. Apparatus for forming the inner ejector tube of a telescoping tampon applicator comprising, a first die means for shaping one end of a tubular cylinder to form an inwardly turned end wall having a central aperture therein, a second die means for shaping the other end of a tubular cylinder to form an outwardly turned bead-like rim, means for supporting a tubular cylinder with its ends in alignment with said first and said second die means, longitudinal tube feeding means for feeding tubular cylinders one at a time in a longitudinal direction to said supporting means, means for moving at least one of said die means towards the other until the distance separating said



die means is less than the length of a tubular cylinder supported therebetween whereby the ends of a tubular cylinder are shaped by said die means to form a tampon applicator tube, means for internally supporting said tubular cylinder when its ends are being shaped by the converging die means, and means for removing a formed ejector tube from said internal supporting means, said die means being heated to soften the tube ends for shaping.

4,104,014

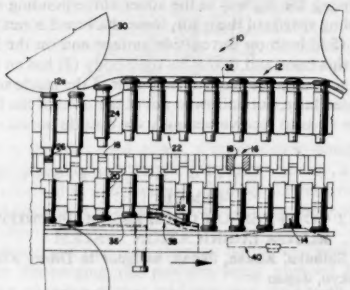
PUNCH FOR COMPRESSING MACHINE

Arthur R. Pearce, Point Pleasant Beach, N.J., assignor to Key Industries, Englishtown, N.J.

Filed Jul. 13, 1977, Ser. No. 815,192

Int. Cl.[2] B30B *11/08*

U.S. Cl. 425—345 **8 Claims**



1. A compressing machine, comprising:

relatively movable punches for compressing a charge of material,

a die head having a plurality of die cavities and axially-extending passageways in which said punches are mounted for reciprocation,

means for controlling the reciprocation of said punches within said passageways relative to said die head,

each of said punches having an opening extending completely therethrough, said opening extending in a direction transverse to the longitudinal axis of said punch,

a resiliently-biased plunger positioned within each of said transverse openings for adjustment relative thereto, and

means for adjusting each of said plungers to engage the walls

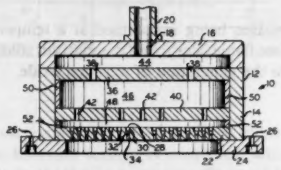
of their respective axial passageways whereby the amount of pressure applied by said plungers to the walls of said passageways may be fixed at a predetermined pressure to prevent undesired movements of said punches.

4,104,015

SPINNERET ASSEMBLY

Richard D. Meyer, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 11, 1977, Ser. No. 758,601
Int. Cl.[2] B29F 3/04; D01D 3/00
U.S. Cl. 425—382.2 **7 Claims**



1. A spinneret assembly comprising:
annular inlet means,
distributor means,
a spinneret, and
means for positioning said annular inlet means, distributor means and spinneret in that order in spaced relationship wherein said annular inlet means is circular and has a plurality of equally spaced orifices positioned therein to generally define in circle having a center concentric with said annular inlet means and a radius ranging from about 25 to about 80 percent of the radius of said distributor means, and
wherein said distributor means is circular and has a plurality of orifices positioned therein to generally define three concentric circles, each circle having a center concentric with said distributor means and the circumference of each circle intersecting the radius of said distributor means at points approximately equally spaced along the radius and between the center and the circumference of said distributor means, and
the orifices defining each circle of said distributor means being equally spaced from each other.

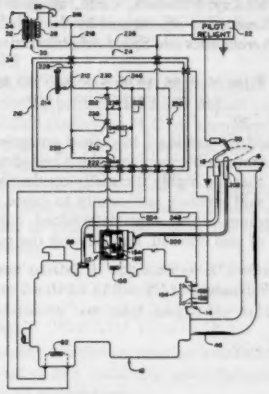
4,104,016

CYCLING PILOT BURNER CONTROL SYSTEM WITH SAFETY TIMING

Robert L. Baysinger, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 3, 1977, Ser. No. 803,072
Int. Cl.[2] F23Q 9/08
U.S. Cl. 431—54 **5 Claims**

1. In a fuel burner control system,
control means including an electrical winding for controlling the flow of fuel to a burner;
means for igniting said burner;
a normally closed bimetal operated safety switch having an electrical resistance heater which, when energized for a predetermined time period, effects opening of said safety switch:
a solid-state switch having a control electrode;
gating circuit means including said resistance heater connected to said control electrode of said solid-state switch for controlling the conduction thereof;
control circuit means including said safety switch, said winding, and said solid-state switch connected in series for controlling initial flow of fuel to said burner;
flame responsive means for effecting energizing of both said circuit means in the absence of a burner flame whereby said resistance heater is energized and said electrical winding is energized to initiate the flow of fuel to said burner, and for effecting de-energizing of both said circuit means when said burner flame exists whereby said resistance heater is de-energized; and



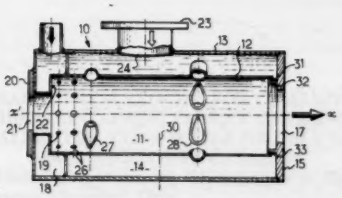
means connected to said electrical winding for maintaining energizing thereof when said flame responsive means effects de-energizing of both said circuit means.

4,104,017

METALLIC NON-PREMIXED GAS-BURNER WITH COUNTER-ROTATION OF GASES

Jean-Marie Georges Fernand Alin, Le Plessis Belleville, France, assignor to Gaz de France, Paris, France

Filed Mar. 30, 1977, Ser. No. 782,629
Claims priority, application France, Feb. 1, 1977, 77 02749
Int. Cl.[2] F23D 15/02
U.S. Cl. 431—352 **12 Claims**



1. A metallic gas-burner with high-velocity gas outflow allowing a high temperature of the burnt gases to be obtained, of the type comprising a central fire-tube comprising a rear portion closed by a rear wall, and a front portion on both sides of a medial transverse plane, said fire-tube constituting a mixing and combustion chamber into which is admitted, on the one hand, a fuel-gas and, on the other hand a gaseous combustion agent usually air, from an annular space constituting an air box provided between the outer wall of the said fire-tube and an external tube surrounding it, the said burner being provided at its front end portion with a front plate closing the said air-box, wherein the fuel gas is supplied at a low pressure, e.g. on the order of a few tens of millibars, into the rear of the fire-tube by a fuel-gas intake and the gaseous combustion agent is distributed at a low pressure into the said fire-tube in the form of at least essentially three main flows from the rear to the front of the said tube, the intake of the first flow being provided in a transverse plane close to the rear wall of the said fire-tube, the intakes of the second and third flows being provided in counter-rotation relationship with respect to one another, the second flow being fed into the rear portion of the

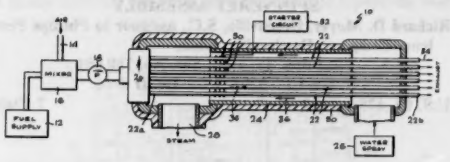
fire-tube and the said third flow being fed into its front portion beyond the said medial transverse plane respectively.

4,104,018
COMBUSTER

Richard A. McKay, Pasadena, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 26, 1976, Ser. No. 745,384
Int. Cl.[2] F24H *1/36, 1/00*
U.S. Cl. 432—29 **10 Claims**

7. A method for heating a load fluid comprising:
passing a combustible medium which includes air, through a conduit that has highly thermally conductive walls, while heating said medium sufficiently to cause combustion of said medium along a predetermined combustion zone portion of said conduit, and flowing the products of said combustion along a transfer conduit portion extending downpath from said combustion zone portion; of and
flowing a load fluid past the outer surface of said conductive walls at said transfer portion and said combustion zone portion of said conduit;



said combustion being maintained at a temperature below that of free flame, along said combustion zone, whereby to minimize the generation of nitrogen oxide.

4,104,019

FIXATION OF DYES AND OTHER CHEMICALS IN TEXTILE FIBRES

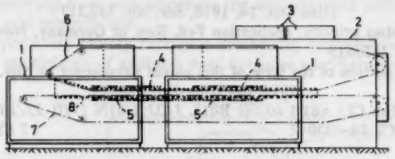
Geoffrey Allan Smith, Melrose, Scotland, assignor to Dawson International Limited, Edinburgh, Scotland

Filed May 18, 1976, Ser. No. 687,602

Claims priority, application United Kingdom, May 21, 1975, 21924/75

Int. Cl.[2] D06P 5/20

U.S. Cl. 8—2 1 Claim



1. A process for the fixation of dyes and other chemicals in textile fibres, however formed or combined, which comprises continuously mechanically conveying fibres which have been wetted with dye or other chemical substance through a closely confining tube located between electrodes by which a radio frequency energy field is created in the tube, the packing of the tube being sufficiently dense as to ensure that when heated by the energy field the tube and its contents form a partially self sealing pressure chamber due to generation of steam from the wetted fibres whereby the rate of reaction of the dye or chemical on the fibres is accelerated.

4,104,020

HAIR DYE COMPOSITIONS CONTAINING 4,7-DIAMINOINDAZOLES

David Rose, Hilden, Germany, assignor to Henkel Kommanditgesellschaft Auf Aktien, Düsseldorf-Holthausen, Germany

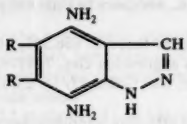
Filed Jun. 14, 1976, Ser. No. 695,454

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1975, 2527791

Int. Cl.[2] A61K 7/13

U.S. Cl. 8—10.2 21 Claims

1. A hair dyestuff of the developer-coupler type, wherein the developer is selected from the group consisting of (I) a substituted 4,7-diaminoindazole of the formula:



wherein one of said R's represents C_1–C_4 alkyl and the other R represents a substituent selected from the group consisting of C_1–C_4 alkyl and H, and (II) the water-soluble salts thereof, and a coupler therefor, said developer and said coupler being present in the molar range of 2:1 to 1:2.

4,104,021

PROCESS FOR DYEING HAIR IN WHICH THE DEPTH OF SHADE IS GRADUALLY INCREASED IN SUCCESSIVE TREATMENTS

Herbert Lapidus, Ridgefield, and Albert Shansky, Norwalk, both of Conn., assignors to Combe Incorporated, White Plains, N.Y.

Continuation-in-part of Ser. No. 690,885, May 28, 1976, abandoned. This application Apr. 20, 1977, Ser. No. 789,076

Int. Cl.[2] A61K 7/12, 7/13

U.S. Cl. 8—10.2 16 Claims

1. A process for dyeing hair by application of a mixture of colorant solution of primary aromatic amines and aminophenols and an oxidant containing H_2O_2 or a peroxy derivative for a time period yielding color development, followed by a rinse removal of the residual mixture;

the improvement to the aforesaid process comprising:

(a) applying said colorant-oxidant mixture in successive applications to gradually get rid of the undesirable hair color, wherein

(i) the time period of application of the mixture being short, on the order of five (5) to fifteen (15) minutes and of substantially the same length for each subsequent application,

(ii) the quantity of colorant solution is suitable for moistening a head of hair uniformly, and substantially constant through all applications,

(iii) the quantity of oxidant in the mixture in the first application is 0.5 to 2 times the amount required to oxidize the primary aromatic amines and aminophenols contained in the colorant solution, and successive applications having increased quantities of oxidant above said initial quantity, ranging up to 10 times the amount required for the aforesaid oxidation;

(b) each mixture having the ability to produce an oxidation color on ordinary human hair; and

(c) each such color being a deeper shade than the preceding application, whereby the user can stop the coloration process at any desirable color attainment and thereafter maintain such color level by repeating the application with the mixture of colorant and oxidant last used.

4,104,022

DURABLE PRESS PROCESS FOR CELLULOSIC FIBER-CONTAINING FABRICS UTILIZING FORMALDEHYDE AND A WATER SOLUBLE LIQUID OR GASEOUS ACID CATALYST

George Louis Payet, Cincinnati, Ohio, assignor to The Strike Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 524,770, Nov. 18, 1974, Pat. No. 3,960,483, and a continuation-in-part of Ser. No. 486,168, Jul. 5, 1974, Pat. No. 3,960,482. This application Apr. 14, 1976, Ser. No. 676,793

The portion of the term of this patent subsequent to Jun. 1, 1993, has been disclaimed.

Int. Cl.[2] D06M 1/14, 1/16, 9/06, 13/14

U.S. Cl. 8—115.6 16 Claims

1. A durable press process for cellulosic fiber-containing fabrics, comprising: impregnating a cellulosic fiber-containing fabric with an aqueous solution containing a water soluble liquid or gaseous acid which is capable of catalyzing the cross-linking reaction betweeen formaldehyde and cellulose; to provide from 0.1% to about 3.5% of said catalyst in said fabric on a dry weight basis, then exposing said impregnated fabric, while said fabric has a moisture content of above 20% by weight where the cellulose fibers are substantially completely swollen, to formaldehyde vapors and curing under conditions at which formaldehyde reacts with cellulose in the presence of the catalyst to improve the wrinkle resistance of the fabric.

4,104,023
RING POLYSULFONATED ALKYLPHENOXY ALKYLOLS AS DETERGENTS

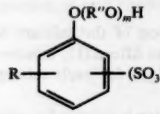
Gar Lok Woo, Tiburon, and Ralph House, El Sobrante, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 97,302, Dec. 11, 1970, abandoned. This application Jun. 24, 1976, Ser. No. 699,402

Int. Cl.[2] D06M *13/26*

U.S. Cl. 8—137 **4 Claims**

1. In a method of washing fabric by contacting said fabric with an aqueous solution containing a detergent amount of detergent active material under conditions of time and temperature to effect substantial soil removal from the fabric, the improvement which comprises carrying out the washing at substantially neutral pH and in the absence of phosphate builders and employing as detergent active material ring polysulfonated alkylphenoxy alkylols of the formula



in which R is linear alkyl of 16 to 22 carbon atoms, X is H or a water-soluble salt-forming cation, *m* is 1 to 10, and R" is alkylene of 1 to 5 carbon atoms, the attachment of said linear alkyl R being greater than 90% ortho.

4,104,024
PROCESS FOR STERILIZATION, MORE PARTICULARLY FOR STERILIZATION OF PACKAGING MATERIALS

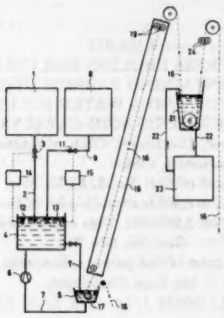
Peter Vogele, Sindelfingen, and Diethard Schulte, Hochheim, both of Fed. Rep. of Germany, assignors to Tetra Pak Developpement, S.A., Lausanne, Switzerland

Filed May 20, 1977, Ser. No. 798,822

Claims priority, application Fed. Rep. of Germany, May 29, 1976, 2624264

Int. Cl.[2] A61L *13/00*; B65B *55/10*; B08B *3/08*

U.S. Cl. 21—58 **16 Claims**



1. A process for sterilizing an article by wetting said article at a temperature below 70° C with a sterilizing solution of a compound having an active-chlorine concentration of from 500 to 20,000 mg/l and being selected from the group consisting of sodium hypochlorite, calcium hypochlorite, chlorinated trisodium phosphate, chlorine dioxide, sodium p-toluenesulfochloroamide, p-toluene-sulfonsulfochloroamide, N-chlorosuccinimide, 1, 3-dichloro-5, 5-dimethylhydantoin, trichlororoisocyanuric acid, salts of trichloroisocyanuric acid, trichloromelamine and dichloroglycoluril, the pH of said sterilizing solution being from 8 to 10, and treating the thus sterilized article with an aqueous solution of hydrogen peroxide at a temperature below 90° C to deactivate any remaining active chlorine, said solution of hydrogen peroxide having a concentration of lower than 30%.

4,104,025
METHOD OF PREPARING LIQUID SAMPLES FOR TESTING

Erich Retzer, Miasach, Germany, assignor to Compur-Werk Gesellschaft mit beschrankter Haftung & Co., Munich, Germany

Filed Oct. 14, 1976, Ser. No. 732,217

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1975, 2553613

The portion of the term of this patent subsequent to Nov. 16, 1993, has been disclaimed.

Int. Cl.[2] A61B *10/00*; B01L *3/02*; G01N *1/10, 33/16*

U.S. Cl. 23—230 R **7 Claims**

1. The method of preparing a liquid sample for testing which comprises the steps of

(a) introducing a quantity of a liquid substance to be tested into a first capillary tube by capillary action,

(b) subjecting the liquid contents of said first tube to centrifugal force exerted in a direction longitudinally of said first tube for a sufficient time to separate said contents into a plurality of components,

(c) thereafter introducing into said first tube a second capillary tube whose external diameter is smaller than the internal diameter of said first tube and allowing capillary action to draw into said second tube a predetermined measured quantity of one of said components in the first tube,

(d) providing a cuvet with a predetermined measured quantity of a reagent liquid,

(e) placing said second tube with said one of said components therein into said cuvet with said reagent liquid therein, and

(f) mixing the component from said second tube with the reagent liquid in said cuvet,

thereby to form in said cuvet a mixture of reagent liquid and selected component from the original substance, ready for testing.

4,104,026
IMMUNOASSAY SEPARATION TECHNIQUE

Gary Brooker; Wesley L. Terasaki, and Michael G. Price, all of Charlottesville, Va., assignors to University of Virginia, Charlottesville, Va.

Continuation-in-part of Ser. No. 666,302, Mar. 12, 1976, Pat. No. 4,022,577. This application Oct. 7, 1976, Ser. No. 730,630

Int. Cl.[2] G01N *33/16, 23/12*

U.S. Cl. 23—230 B **14 Claims**

1. In a method for effecting immunoassay of a multiplicity of samples, each possibly containing an antigen or an antibody to be assayed, wherein each sample is incubated with a solution containing a detectable antigen or antibody to form a multiplicity of mixtures, each mixture containing as components:complexed antigen-antibody, non-complexed antigen and non-complexed antibody, separating at least one of the components

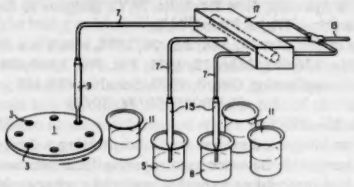
of said mixture by adsorption and thereafter detecting the quantity of detectable antigen or antibody, in the non-adsorbed portions of the mixture,

the improvement which comprises continuously and sequentially separating at least one component intended to be separated from each of said multiplicity of mixtures by

passing a first mixture from said multiplicity of mixtures over an adsorbent which adsorbs the components intended to be separated from said mixture,

removing from said adsorbent the non-adsorbed portion of said mixture, and

repetitively passing each next succeeding mixture from said multiplicity of mixtures over the same adsorbent without



intermittent removal of the components of the mixture which had been adsorbed onto said adsorbent from the preceding mixtures, and removing from said adsorbent the non-adsorbed portion following each pass,

wherein each sequential mixture is in contact with said adsorbent for a residence time which is sufficient to permit adsorption of the said component, but which is insufficient to effect significant disassociation of the prior adsorbed component, and which is insufficient to effect adsorption of additional components of said mixture onto the additional adsorption sites created on said adsorbent by the prior adsorption of the components from the preceding mixture.

4,104,027

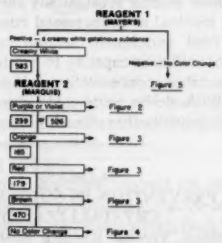
PROCESS FOR THE PRESUMPTIVE IDENTIFICATION OF NARCOTICS AND DRUGS OF ABUSE

Robert B. Carroll, P.O. Box 305, S. Paris, Me. 04281

Filed Nov. 21, 1977, Ser. No. 853,682

Int. Cl.[2] G01N *33/16*

U.S. Cl. 23—230 B **6 Claims**



1. A process for the presumptive identification of narcotics and drugs of abuse which comprises applying to a sample of the drug in an amount within the range from about 2 to about 3 mg in the sequence stated:

(1) from about 0.5 to about 0.55 ml Mayer's reagent and then

(2) in the event a creamy white precipitate forms, applying Marquis reagent; and then

(a) in the event a purple color No. **259** (PC) or violet color No. **526** (PCS) forms, applying the test sequence of FIG. **2**;

(b) in the event an orange color No. **165** (PCS) forms, a red color No. **179** (PCS) forms, or a brown color No. **470** (PCS) forms, applying the sequence of FIG. **3**; and

(c) in the event there is no color change, applying the sequence of FIG. **4**; and

(3) in the event there is no precipitate with Mayer's reagent, applying the sequence of FIG. **5**; and thereby identifying the drug according to the color changes produced in the test sequences applied.

4,104,028

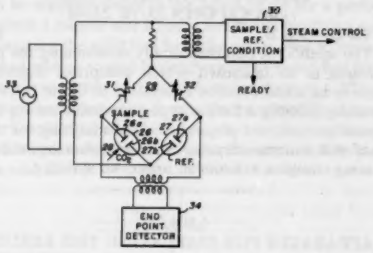
METHOD OF TITRATING LIQUOR

John Joseph Howarth, Monte Sereno, Calif., assignor to Measurex Corporation, Cupertino, Calif.

Continuation-in-part of Ser. No. 629,859, Nov. 7, 1975, Pat. No. 4,012,197. This application Mar. 3, 1977, Ser. No. 774,157

Int. Cl.[2] G01N *27/10*

U.S. Cl. 23—230 R **6 Claims**



1. A method of titrating alkali paper pulp solution comprising the steps of:

removing a portion of said solution into a sample vessel, said portion having a known volume;

selecting a physical characteristic of said solution; introducing carbon dioxide into the sample vessel; monitoring the amount of carbon dioxide introduced; detecting an abrupt change in said physical characteristic of said solution;

measuring the total amount of carbon dioxide introduced into said sample vessel immediately upon the detection of said abrupt change; and

calculating the alkalinity of said solution based upon said amount of carbon dioxide measured and said known volume of said portion.

4,104,029

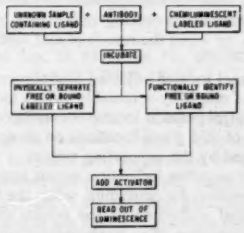
PROCEDURE FOR THE ASSAY OF PHARMACOLOGICALLY IMMUNOLOGICALLY AND BIOCHEMICALLY ACTIVE COMPOUNDS IN BIOLOGICAL FLUIDS

Charles L. Maier, Jr., P.O. Box 232, Yardley, Pa. 19067

Division of Ser. No. 607,151, Aug. 25, 1975. This application Mar. 22, 1977, Ser. No. 780,204

Int. Cl.[2] G01N *33/16, 21/22*; C09K *11/00*

U.S. Cl. 23—230 B **14 Claims**



1. A method of determining the presence of a ligand in a medium suspected of containing said ligand which comprises;

bringing together in an aqueous liquid zone; (1) said medium; (2) a chemiluminescent labeled ligand; and (3) a soluble receptor having sites capable of bonding to said ligand and said chemiluminescent labeled ligand; the concentration of said receptor being such that there are insufficient receptor sites to combine with all of said labeled ligand present in the three component mixture; and analysing in said zone for the effect of said medium on the amount of chemiluminescent labeled ligand bound to said receptor.

4,104,030

PHOTOMETRIC DETERMINATION OF PROTEIN, AND OF ENDOTOXIN WITH LIMULUS PROTEIN

Robert E. Hopkins, II, Morton Grove, and Kathleen Hughes, Des Plaines, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 4, 1977, Ser. No. 848,628
Int. Cl.[2] G01N *33/16, 21/06*
U.S. Cl. 23—230 B **6 Claims**

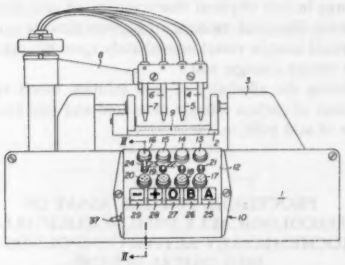
1. The method of photometrically determining the presence of protein in an unknown which comprises digesting said protein in an alkali solution equivalent to 0.1 to 0.4N sodium hydroxide, forming a Lowry-type protein-indicating complex with said protein, and photometrically analyzing for the presence of said protein-indicating complex, whereby said protein-indicating complex exhibits an improved stability.

4,104,031

APPARATUS FOR DISPLAYING THE RESULTS OBTAINED ON AN AGGLUTINATION SUPPORT

Romain Gabriel Robuchon-Merovak, Levallois-Perret, and Christian Romain Robuchon-Merovak, Paris, both of France, assignors to Readymatie S.A., Lausanne, Switzerland

Filed Dec. 8, 1975, Ser. No. 638,462
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—253 R **9 Claims**



7. In a blood-typing installation comprising means for supporting at a position where it can be visually examined an agglutination support carrying, at given discrete locations, a series of blood tests each with a mixture of blood taken from an individual and an appropriate test serum, said blood tests having visually perceptible results depending on a state of agglutination and a state of non-agglutination of said mixtures, a display apparatus for providing indications, A, B, AB or O followed by + or −, of the results of said tests, said apparatus comprising

a control panel located adjacent said supporting means;

a plurality of manually-actuatable switch members disposed on the control panel at locations corresponding to respective ones of said given locations on an agglutination support carried by the supporting means;

positive and negative indication means associated with the switch members for providing, when the switch members are actuated according to the results of the tests after visual examination of an agglutination support carried by the supporting means, positive and negative indications representing respectively said state of agglutination and said state of non-agglutination of said mixtures corresponding to the results of the tests, said positive and negative indications being disposed spaced apart from one another on the control panel and in correlation with the locations of the switch members; and

display means for selectively displaying the letters A, B, O and the signs + and − in response to actuation of said switch members and in correspondence with said positive and negative indications corresponding to the results of the tests.

4,104,032

DUAL TEMPERATURE EXCHANGE SYSTEMS

Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, White Plains, N.Y.

Division of Ser. No. 492,186, Jul. 26, 1974, which is a division of Ser. No. 126,692, Mar. 22, 1971, Pat. No. 3,860,698. This application Oct. 3, 1975, Ser. No. 619,462
Int. Cl.[2] B01D *59/24, 59/33*
U.S. Cl. 23—270.5 W **20 Claims**

1. In an integrated system for concentrating a desired material exchangeable between two separate fluid substances containing said material and another material exchangeable therewith, at least one of said fluid substances being in liquid phase, said system including

(a) a first enrichment section comprising a first stage operating system having at least one pair of dual temperature exchange hot and cold towers and a prescribed feed supply of one of said fluid substances, and connected thereto

(b) an intermediate enrichment section comprising an operating system of at least a second stage of dual temperature exchange hot and cold towers, and connected thereto

(c) a final enrichment section comprising a system for further enriching at least one of the enriched fluids from said intermediate enrichment section to a prescribed final product concentration,

the improvement which provides for modification to increase the quantity of final product output without physical alteration of the intermediate and final enrichment sections wherein:

(1) the hot and cold towers of said first enrichment section comprise enrichment means which include therein countercurrent contact exchange elements sufficient in number to provide that when the volume of enriched fluids withdrawn from said first enrichment section and delivered to said second enrichment section is fractionally reduced such reduced volume will transport to the intermediate enrichment section substantially the same amount of the desired material at an increased concentration, and

(2) said final enrichment section comprises enrichment means of sufficient capacity to produce a final product of the prescribed concentration when said volume of enriched fluids delivered to said second enrichment section is not so fractionally reduced.

4,104,033

FOAM PREVENTION IN SODIUM CARBONATE CRYSTALLIZATION

Frederick Mahn, Verona; Kenneth Breindel, Landing; Clyde Scanley, Morristown, and David Sexsmith, Kinnelon, all of N.J., assignors to Drew Chemical Corporation, Boonton, N.J.

Continuation-in-part of Ser. No. 612,641, Sep. 12, 1975, abandoned. This application May 20, 1976, Ser. No. 688,271
Int. Cl. B01d *9/02;* C01d *7/24*
U.S. Cl. 23—300 **16 Claims**

1. In a process for crystallizing a carbonate of sodium from an aqueous solution containing a carbonate of sodium, the improvement comprising:

effecting said crystallization in the presence of a foam preventing amount of a defoamer consisting essentially of at least one water soluble oxyalkylene polymer, said oxyalkylene polymer being selected from the group consisting of oxyethylene homopolymers have a molecular weight of

at least 200 and no greater than about 1,000,000; regular block copolymers of oxyethylene and oxypropylene wherein the molecular weight is at least 200 and no greater than from about 1,000 to about 4,500 when the oxyethylene content is from about 10 to about 50%, by weight, the molecular weight being at least 200 and no greater than about 4,500 to about 13,000 when the oxyethylene content is from about 50% to about 75%, and the molecular weight being at least 200 and no greater than from about 13,000 to about 1,000,000 when the oxyethylene content is at least 75%, by weight; and reverse oxyethylene-oxypropylene block copolymers wherein the molecular weight is at least 200 and no greater than about 2,400 to about 4,000 when the oxyethylene content is from about 10% to about 40%, by weight, with the molecular weight being at least about 200 and no greater than about 4,000 to about 1,000,000 when the oxyethylene content is above about 40%, by weight, said oxyalkylene polymer being in a form selected from the group consisting of glycols and glycols in which at least one of the terminal hydrogen atoms is substituted with a residue selected from the group consisting of a hydrocarbon alcohol having 1–5 carbon atoms, a hydrocarbon carboxylic acid having 1–5 carbon atoms, and a hydrocarbon amide having 1–5 carbon atoms.

4,104,034

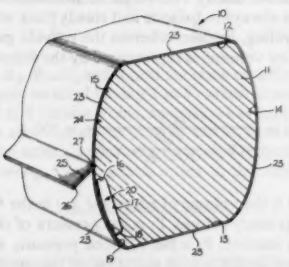
EASY LIGHTING FIREPLACE LOG

Kent Yengtsu Wu, and Roger S. Barron, both of Stockton, Calif., assignors to Duraflame, Inc., Stockton, Calif.

Continuation-in-part of Ser. No. 705,687, Jul. 15, 1976, abandoned. This application May 5, 1977, Ser. No. 793,947

Int. Cl.[2] C10L *5/00, 11/00, 5/14*

U.S. Cl. 44—10 R **13 Claims**



12. An artificial fireplace log assembly comprising:

an artificial fireplace log consisting substantially of comminuted cellulosic material and a wax bonding agent,

an elongated groove in said log,

a wrapper covering said log,

a layer of combustible material disposed on said wrapper facing said groove and substantially out of contact with said log, said material comprising a high flash point resin, a gelling agent for inhibiting the combustible material from dripping off the wrapper when ignited and a wax binder, said wrapper functioning as a wick for said combustible material, and

an elongated flap on the outside of said wrapper, said flap terminating adjacent an edge of said groove,

whereby when said flap is ignited, the flame will burn through said wrapper to admit air into said groove, thereby providing sufficient oxygen to support ignition of said combustible material, the separation of said combustible material from said log preventing heat transfer away from said combustible material into said log so that said high flash point resin will be ignited by the burning flap and wicking action of said wrapper.

4,104,035

PREPARATION OF SOLID FUEL-WATER SLURRIES

Edward L. Cole, Fishkill; Howard V. Hess, Glenham, and Frank E. Guptill, Jr., Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 11, 1975, Ser. No. 639,730

Int. Cl.[2] C10L *1/32*

U.S. Cl. 44—51 **16 Claims**

1. A process for the preparation of a pumpable solid fuel-water slurry having a solids content measured on a dry basis of between about 50 and 60% by weight said solid fuel having a particle size such that at least 70% passes through a 200 mesh sieve which comprises subjecting finely-divided solid fuel selected from the group consisting of sub-bituminous coal and ligaite to a hydrothermal treatment by forming a mixture of finely-divided solid fuel and water, heating the mixture to a temperature between about 300 and 700° F. under a pressure sufficient to maintain water in the liquid phase for a period of time between 1 minute and 2 hours under non-oxidizing conditions, separating the solid fuel from the water used to form said mixture and adding to said hydrothermally treated fuel having a particle size such that at least 70% passes through a 200 mesh sieve water in an amount to form a slurry containing about 50 to 60 wt. % solid fuel and also adding as a surface active agent a salt of an organic sulfonic acid in an amount to confer pumpability to said slurry.

4,104,036

IRON-CONTAINING MOTOR FUEL COMPOSITIONS AND METHOD FOR USING SAME

Tai S. Chao, Homewood, and Ernest H. Owston, Jr., Park Forest, both of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Mar. 8, 1976, Ser. No. 664,731

Int. Cl.[2] C10L *1/18*

U.S. Cl. 44—56 **14 Claims**

1. A fuel composition comprising a major amount of hydrocarbons boiling in the gasoline boiling range; a minor amount capable of improving the octane rating of said composition of at least one hydrocarbon-soluble compound of iron; a minor amount of at least one aliphatic alcohol containing from 1 to about 8 carbon atoms and a minor amount of at least one organic peroxy component containing from 1 to about 20 carbon atoms, wherein said iron compound and the combination of said alcohol and said component are present in mutually activating amounts to improve the octane number rating of said fuel composition.

4,104,037

GASEOUS DIFFUSION SYSTEM

George A. Garrett, Oak Ridge, Tenn., and John Shacter, Stamford, Conn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 23, 1957, Ser. No. 685,762

Int. Cl.[2] B01D *59/10*

U.S. Cl. 55—16 **9 Claims**

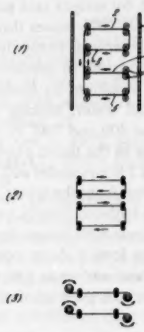
1. A gaseous diffusion system comprising a plurality of diffusers connected in cascade to form a series of stages, each of said diffusers having a porous partition dividing it into a high pressure chamber and a low pressure chamber, and means for combining a portion of the enriched gas from a succeeding stage with a portion of the enriched gas from the low pressure chamber of each stage and feeding it into one extremity of the high pressure chamber thereof.

4,104,038

DESORPTION OF VOLATILE COMPOUNDS DISSOLVED IN A LIQUID PHASE

Christian Rubens Josis, Gembloux, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed Jun. 15, 1976, Ser. No. 696,175
Claims priority, application Belgium, Jun. 24, 1975, 830595
Int. Cl.[2] B01D *19/00*
U.S. Cl. 55—19 **6 Claims**



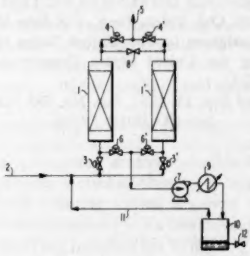
1. A method of desorption of volatile compounds from an aqueous liquid containing ammonia, by means of a stripping column, comprising the steps of supplying the aqueous liquid to the upper part of the column, blowing a gaseous mixture including free oxygen into the lower part of the column, supplying at least one of sodium hydroxide and calcium hydroxide to an intermediate part of the column at a plurality of levels, withdrawing a gaseous mixture including ammonia from the top of the column, measuring the pH and the temperature of the aqueous liquid at a plurality of levels in the column, controlling the flow rate of the aqueous liquid and the flow rate and temperature of the gaseous mixture blown in and of the hydroxide so that the pH of the aqueous liquid, at least in a predetermined zone in the column, is at least 11 and, subsequently reacting the ammonia content and oxygen content of the withdrawn gaseous mixture, the amount of oxygen in the gaseous mixture blown in being controlled so that substantially only water and nitrogen are produced.

4,104,039

PROCESS FOR CONCENTRATING OR LIQUEFYING A SPECIFIED COMPONENT OF A GASEOUS MIXTURE

Setuya Kuri, Kamakura, and Sinji Fuwa, Yokohama, both of Japan, assignors to Kuri Chemical Engineers, Incorporated and Chlorine Engineers Corp., both of Tokyo, Japan

Filed Oct. 21, 1976, Ser. No. 734,566
Claims priority, application Japan, Oct. 22, 1975, 50-126337
Int. Cl.[2] B01D *53/04*
U.S. Cl. 55—23 **9 Claims**



1. A process for concentrating or liquefying a specified component of a gaseous mixture as a product, characterized by a combination of a step comprising passing a starting gaseous mixture containing a dilute gaseous substance to be selectively separated as said specified component into one adsorbing layer of an adsorbing device consisting of a pair of adsorbing layers to allow it to adsorb the gaseous substance to be selectively separated, releasing the remainder of the gaseous mixture, and before the amount of the adsorbed gas in the said one adsorbing layer reaches saturation, switching the passing of the starting gaseous mixture over to the other of said adsorbing layers; a step comprising maintaining the pressure of the inside of the adsorbing layer which has adsorbed the gaseous substance to be selectively separated lower than the pressure of the starting gaseous mixture fed, feeding a part of the gas released from the other adsorbing layer which now has a low concentration of the gaseous substance to be selectively separated or an inert gas from outside the system to desorb the adsorbed gas and to obtain a gas rich in said gaseous substance to be selectively separated, again passing the starting gaseous mixture after the end of desorption into said one adsorbing layer, and switching the desorption of the adsorbed gaseous mixture over to the said other adsorbing layer; and a step comprising mixing the desorbed gas which is rich in said gaseous substance to be selectively separated with the starting gaseous mixture either directly or after separation of the resulting liquefied gas to thereby increase the concentration of said gaseous substance to be selectively separated in said starting gaseous mixture, and recycling and passing the resulting gaseous mixture having the increased concentration of said gaseous substance to be selectively separated through the adsorbing layer; wherein the recycling is repeated until the concentration of the specified component in the recycle gas to be passed into the adsorbing layer increases to the desired concentration or said component is liquefied, and the specified component having attained the desired concentration or the liquefied specified component is thereafter continuously recovered to maintain the gas recycling system always in balance and steady state while continuing the recycling, further, wherein the recycle gas concentration Cn (% by volume) is represented by the following general formula:

$$Cn(\%) = \frac{nCo}{nCo + \frac{P_0 D}{P_1 - P_2} \times N} \times 100$$

wherein Co is the volume of adsorbate gas in the feed, D is the volume of primary-off gas, P_1 is the pressure of the feed starting gaseous mixture, P_0 is the reduced pressure, n is the recycling number until the concentration of the specified component in the recycle gas to be passed into the adsorbing layer reaches the desired concentration or said component is liquefied, Cn is the recycled gas concentration, wherein the concentration of Co is from 0.01 to 10% (by volume), the recycling number n is at least 5, $P_0/P_1 - P_0$ is a value not larger than about 0.3, and N is a value of from about 1.2 to about 10.

4,104,040

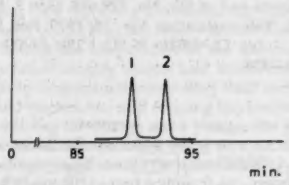
USE OF S-TRIAZINE DERIVATIVES IN A GAS CHROMATOGRAPHIC METHOD

Naobumi Oi; Koichi Moriguchi, both of Kyoto, and Mari Matsuda, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

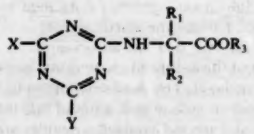
Division of Ser. No. 660,680, Feb. 23, 1976, abandoned. This application Jan. 21, 1977, Ser. No. 760,849
Int. Cl.[2] B01D *15/08*
U.S. Cl. 55—67 **11 Claims**

1. In a gas chromatographic method for the resolution and analysis of a mixture of enantiomers having an —NH— group linked to an asymmetric carbon atom or to an atom in the α-position with respect to an asymmetric carbon atom comprising reacting said mixture with an optically active reagent to form the diastereomers and resolving and analyzing the diaste-

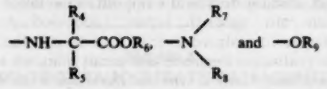
reomers on an optically inactive stationary phase, the improvement which comprises using as the stationary phase an s-tria-



zine derivative with at least one asymmetric carbon atom of the following general formula:



wherein R_1 and R_2 are different and are each hydrogen, an alkyl having 1 to 8 carbon atoms, an aralkyl having 1 to 2 carbon atoms in the alkyl moiety or phenyl; R_3 is an alkyl having 1 to 12 carbon atoms, a cycloalkyl having 5 to 6 carbon atoms, an aralkyl having 1 to 2 carbon atoms in the alkyl moiety or phenyl; and X and Y are the same or different and are each a member selected from the group consisting of the moieties:



wherein R_4, R_5, R_7, R_8 and R_9 are the same or different and are each hydrogen, an alkyl having 1 to 8 carbon atoms, a cycloalkyl having 5 to 6 carbon atoms, an aralkyl having 1 to 2 carbon atoms in the alkyl moiety or phenyl; and R_6 is an alkyl having 1 to 12 carbon atoms, a cycloalkyl having 5 to 6 carbon atoms, an aralkyl having 1 to 2 carbon atoms in the alkyl moiety or phenyl.

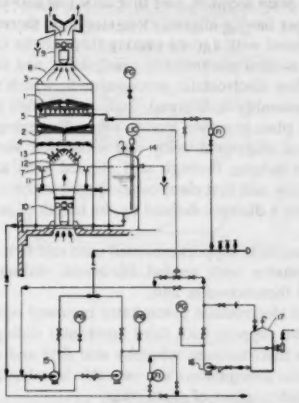
4,104,041

APPARATUS AND METHOD FOR TREATING WASTE GAS FROM UREA PRILLING TOWER

Hidemasa Arita, Hunabashi; Hitoshi Tomiyama, Tokyo, and Shigeyasu Mori, Tama, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Japan

Filed Dec. 8, 1976, Ser. No. 748,541
Int. Cl.[2] B01D *47/00*
U.S. Cl. 55—90 **10 Claims**

1. A process for treating waste gas from a urea prilling tower employing a scrubbing solution, said waste gas containing hydrophilic and water-soluble fumes, which process is characterized by that in a scrubbing tower, which is provided with a perforated tray, a slightly inclined lower mesh tray, a spraying device of scrubbing solution, a slightly inclined upper mesh tray, and a demister, the waste gas is caused to flow successively through the perforated tray, the lower mesh tray, the upper mesh tray and the demister; scrubbing solution is sprayed co-currently with the flow of said waste gas from a position between the upper mesh tray and lower mesh tray onto the underside of said upper mesh tray from a plurality of nozzles uniformly distributed throughout the cross-sectional area of the scrubber to cause the scrubbing solution to fully wet the entire surface of said upper mesh tray and to form a continuous liquid film on said upper mesh tray; and causing said liquid film to flow from said upper mesh tray to said lower mesh tray and thereby form a coninuous film on said lower mesh tray and to thereafter flow to the perforated tray, and thus, the waste gas, which is introduced into said scrubbing tower from the bottom while said scrubbing solution is discharged from said tower wetting said perforated tray, is con-



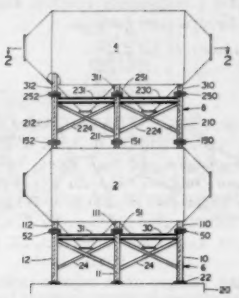
tacted with said scrubbing solution on each of the above described trays so as to remove the fumes in said waste gas, and further mist, which is the liquid entrainment with said waste gas when it passes through the upper mesh tray, is recovered by means of said demister.

4,104,042

MULTI-STORIED ELECTROSTATIC PRECIPITATOR

Nicholas J. Brozenick, Clarksville, Ind., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Apr. 29, 1977, Ser. No. 792,240
Int. Cl.[2] B03C *3/82*
U.S. Cl. 55—101 **2 Claims**



1. A multi-storied electrostatic precipitator comprising:

a base support including a vertically extending member at each corner;

a first electrostatic precipitator including a vertically extending member at each corner in alignment with and movably fastened to a respective one of said vertically extending members of said base support to provide pairs of vertically extending members with first horizontal sliding means disposed therebetween, said first horizontal sliding means including a connection assembly connecting each pair of aligned vertically extending members, said connection assembly including a pair of plate members, one plate member being attached on one face to said vertically extending member of said first electrostatic precipitator, the other plate member being attached on one face to said

vertically extending member of said base support with a sliding connection assembly disposed therebetween, said sliding connection assembly including a first slide pad attached to an opposed face of said one plate member and a second slide pad attached to an opposed face of said other plate member, said first slide pad and said one plate member having aligned elongated slots therein in parallel alignment with a plane passing through the center of said multi-storied electrostatic precipitator and the corner of said first electrostatic precipitator to which said connection assembly is disposed, said second slide pad and said other plate member having aligned openings therein in vertical alignment with said elongated slots, and bolt means passing through said aligned slots and openings whereby said first electrostatic precipitator is freely movable for a distance defined by the length of said elongated slots;

an intermediate support mounted onto said first electrostatic precipitator with second horizontal sliding means disposed therebetween; and,

a second electrostatic precipitator mounted onto said intermediate support with third horizontal sliding means disposed therebetween whereby said first and second electrostatic precipitators are movable in a horizontal direction independent of each other.

4,104,043

ESTERS OF 3-HYDROXYINDONE COMPOUNDS AS HERBICIDES AND MITICIDES

John A. Durden, Jr., South Charleston; Anthony A. Sousa, St. Albans, both of W. Va., and John F. Stephen, New City, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 12, 1972, Ser. No. 314,370

Int. Cl.[2] A01N *9/24*

U.S. Cl. 71—107 **34 Claims**

1. A pre-emergent herbicide comprising an extender and as an active toxicant a herbicidally effective amount of a compound having the structural formula:

wherein:

R^1 is hydrogen, halogen or an organic radical;

R^2 is hydrogen, methyl, ethyl, methoxy, ethoxy, fluorine, chlorine, bromine, trichloromethyl, trifluoromethyl or mixed chlorofluoromethyl;

R^3 is hydrogen, lower alkyl, lower alkoxy, fluorine, chlorine, bromine, nitro, acylamido, trichloromethyl, trifluoromethyl or mixed chlorofluoromethyl;

R^4 is methyl, ethyl, methoxy, ethoxy, fluorine, chlorine or bromine;

R^5 is hydrogen, lower alkyl, lower haloalkyl, lower alkoxy, acylamido, fluorine, chlorine or bromine;

R^6 is hydrogen, lower alkyl, lower alkoxy, fluorine, chlorine, bromine, trifluoromethyl, trichloromethyl or acylamido;

n is a small whole number from 1 to 4; and

R^2 and R^5 or R^4 and R^5 taken together, may be —CH=CH—CH=CH— with the proviso that when R^4 is ethyl, methoxy or ethoxy R^2, R^3 and R^5 may not all be hydrogen.

4,104,044

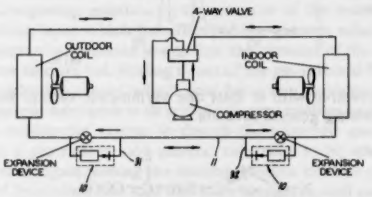
BIDIRECTIONAL FLOW FILTER-DRIER ASSEMBLY

Harold T. Lange, St. Louis, Mo., assignor to Sporlan Valve Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 729,670, Oct. 5, 1976, Pat. No. 4,029,580. This application Apr. 21, 1977, Ser. No. 789,360

Int. Cl.[2] B01D *39/02;* **F25B** *13/00*

U.S. Cl. 62—324 **4 Claims**



1. A filter-drier assembly for heat pump systems in which a compressor is connected by mode-switching valve means to an outdoor coil and an indoor coil, a liquid line interconnects the coils, and first and second expansion devices are located in the liquid line, the first expansion device being located ahead of the outdoor coil for use in one mode of operation, and the second expansion device being located ahead of the indoor coil for use in the other mode of operation, comprising:

(a) a pair of bypass lines in the liquid line, each bypass line circumventing one of the expansion devices, and

(b) a filter-drier unit in each bypass line, each filter-drier unit including a check valve means enabling flow through the associated bypass line and filter-drier unit in one direction and precluding flow in the opposite direction.

4,104,045

THERMALLY STABLE QUARTZ GLASS

Manfred Mansmann, Krefeld, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jul. 6, 1976, Ser. No. 702,835

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1975, 2530808

Int. Cl.[2] C03B *37/00, 32/00;* **C04B** *35/64*

U.S. Cl. 65—2 **6 Claims**

1. The process for the production of SiO_2 fibers consisting essentially of hydrolyzing a silicate ester to form an alkali metal and alkaline earth metal-free SiO_2-containing solution or sol, adding a high molecular weight filament-forming material selected from the group consisting of a polymeric C_1 to C_4 alkylene oxide, polyvinyl alcohol, polyvinyl acetate, polyvinyl pyrrolidone, polyvinyl butyral, polymethacrylate, cellulose derivative and polyacrylamide, incorporating into said solution or sol at least one alkali metal and alkaline earth metal-free compound of chromium or manganese in about 0.05 to 20% by weight expressed as Cr_2O_3 and Mn_2O_3 based on SiO_2, spinning said solution or sol to form filaments, and subjecting said filaments to a thermal treatment to effect crystallization, whereby the resulting filaments are of improved thermal stability.

4,104,046

TEMPERATURE CONTROL FOR THE FORMING UNITS OF A MACHINE OF THE PRESS AND BLOW TYPE

Cecil Wayne McCreery, Columbus, Ohio, assignor to Glass Industry Consultants, Inc., Columbus, Ohio

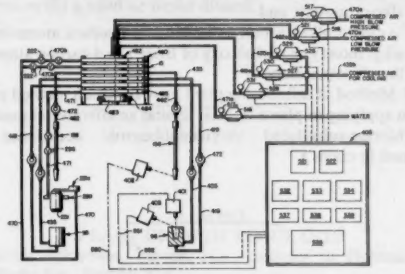
Filed Jun. 16, 1977, Ser. No. 807,169

Int. Cl.[2] C03B *9/40, 11/12*

U.S. Cl. 65—161 **28 Claims**

1. Apparatus for forming articles from charges of deformable hot material which includes an implement for forming successive charges of the hot material into shaped articles and thereby absorbing some of the heat from the charges, means for subjecting the implement to temperature-controlling fluid,

and means for automatically controlling the supply of that fluid by temperature-sensing means directed at said implement subsequent to each forming operation so that it will be at the proper controlled temperature for forming the successive charges; said means for subjecting the implement to temperature-controlling fluid supplying it continuously, and said means for automatically controlling the supply of that fluid varying it in accordance with the temperature of the implement sensed by said temperature-sensing means; said means for subjecting the implement to temperature-controlling fluid including fluid passages in said implement; said forming implement including a mold for receiving the charge and a plunger for pressing the charge in the mold, said passages being formed in said mold and in said plunger; said means for automatically controlling the supply of temperature-controlling fluid comprising independent means for controlling the supply to the passages of the mold and the plunger including independent temperature-sensing means directed at the mold and the plunger; said mold and



cooperating plunger producing a pressed blank; said apparatus including blow molds for receiving the successive blanks, said temperature-controlling means causing the successively formed blanks to be at a proper controlled temperature for blowing; a rotatable turret which carries a plurality of forming units each of which includes one of said blank molds and a cooperating plunger for pressing a blank and a blow mold for subsequently blowing the blank into final shape, said temperature-sensing means being located around the turret to sense the blank mold after the article is formed therein and the plunger after it has been withdrawn from the blank mold in which it pressed the blank; a fluid supply unit mounted in cooperative relationship with said turret, said independent means for controlling the supply of fluid to the passages of the mold and plunger including a separate supply line connected to each, said fluid supply unit comprising manifolds which rotate with said turret and are connected to each of said supply lines, and a source of supply connected to said manifolds to permit relative rotation thereof.

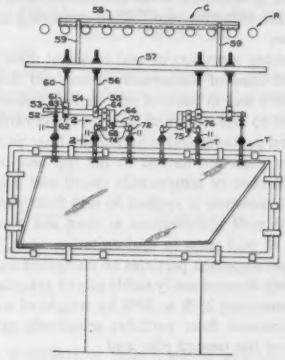
4,104,047

SUPPORTING GLASS GRIPPING TONGS DURING GLASS SHEET PROCESSING

Samuel L. Seymour, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 23, 1977, Ser. No. 799,411
Int. Cl.[2] C03A *23/02*
U.S. Cl. 65—273 **5 Claims**

1. Apparatus for press bending glass sheets, comprising:
a furnace for heating glass sheets to a softened condition;
conveyor means extending horizontally from the furnace over a bending position in a longitudinal direction defining a direction of glass travel;
a pair of opposed complementary bending molds mounted for reciprocation in a direction transverse to the direction of glass travel toward opposite sides of said bending position so as to bend a vertically suspended glass sheet therebetween;
a carriage adapted for movement by the conveyor means in the direction of glass travel;
first pivot means supported by the carriage with essentially no freedom of motion in the direction of glass travel relative to the carriage;
a first pivot bar rotatably affixed to the carriage by way of said pivot means so as to permit rotation of the bar in a vertical plane parallel to the direction of glass travel;



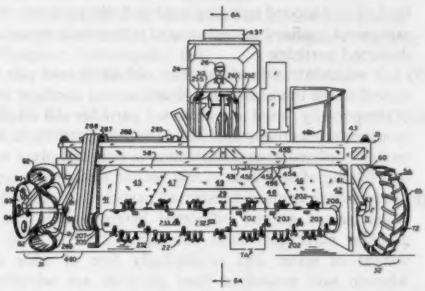
stop means carried by the carriage for limiting the rotation of the pivot bar to a small angle from horizontal; and
a set of glass-gripping tongs affixed to each end of the pivot bar so as to swing freely in transverse planes with essentially no freedom to oscillate in the longitudinal direction of glass travel.

4,104,048

MANURE TREATING PROCESS

Marvin L. Urbanczyk, Rte. 2, White Deer, Tex. 79097

Continuation-in-part of Ser. No. 550,272, Oct. 18, 1975, Pat. No. 4,019,723. This application Dec. 16, 1976, Ser. No. 751,153
Int. Cl.[2] C05F *11/08*
U.S. Cl. 71—9 **8 Claims**



1. A process of treating masses of manure from cattle feedlots, said masses comprising dimensionally stable lumps of size in excess of $\frac{1}{2}$ inch diameter and containing portions from $\frac{1}{4}$ inch diameter to −40 mesh size, which process comprises the sequence of steps of
(1) arraying said masses of manure in horizontally elongated dimensionally stable ground supported piles of substantially uniform transverse cross section and exposed to the atmosphere;
(2) adding water to each of said piles to bring the percentage moisture thereof to the mass of said pile within the range of 25% to 35% water by weight;
(3) flailing portions of the resultant stationary dimensionally stable masses by passing a series of flails in one horizontal direction through an agitating zone in said stationary resultant dimensionally stable mass, said series of flails

extending horizontally and transversely to said one horizontal direction, each of said series of flails moving in an upward direction while said flail moves in said one direction to selectively reduce the amount of material in said resultant mass which material is in form of lumps in excess of ½ inch in diameter, while not substantially affecting the −40 mesh particles; said flailing occurring in such agitating zone;

(4) and raising a portion of said resultant mass and creating confined zone of temporarily raised and dispersed particles above and in back of said agitating zone and adding moisture to said confined zone of temporarily raised and dispersed particles and wherein the finer particles of said resultant mass are moved to the top and center of said confined zone of temporarily raised and dispersed particles and moisture is applied to said finer particles in said confined zone concomitant in time and place with said flailing of said mass in said agitating zone, and forming from said dispersed particles an elongated treated ground supported dimensionally stable pile of granular particulate mass containing 25% to 30% by weight of water wherein said moistened finer particles selectively applied to the outside of the treated pile; and

(5) after each of a plurality of periods of time during which the thus treated pile mass is subjected to bacterial action and air to form a resultant dimensionally stable treated pile, and

(6) sequentially flailing successive portions of said dimensionally stable treated pile by passing a series of flails in a horizontal direction through a second agitating zone in said dimensionally stable treated pile, said series of flails extending horizontally and transversely to said last horizontal direction, each of said series of flails moving in an upward direction while said flails move in said last horizontal direction to selectively reduce the amount of material in said resulting treated pile which is in form of lumps in excess of ½ inch in diameter, while not substantially affecting the −40 mesh particles; and then raising a portion of said pile and creating a second confined zone of temporarily raised and dispersed particles above and in back of said second agitating zone and adding moisture to said raised confined second zone of temporarily raised and dispersed particles;

(7) and wherein the finer particles of said treated pile are moved to the top and center of said second confined zone of temporarily raised and dispersed particles and wherein moisture is selectively applied to the finer particles in said second confined zone concomitant in time and place with said flailing of said mass in said second agitating zone;

(8) and forming from said dispersed particles a second elongated treated ground supported heterogeneous pile of granular particulate mass containing 25% to 30% by weight of water and substantially free of odor and wherein said moistened finer particles are selectively applied to the outside of said second pile.

4,104,049
CHLORINE-SUBSTITUTED VINYLAMINOBENZOIC ACID COMPOUNDS AND PLANT GROWTH REGULANT COMPOSITIONS

Fritz Maurer; Hans-Jochem Riebel; Rolf Schroder, all of Wuppertal, and Klaus Lürssen, Berg.Gladbach, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

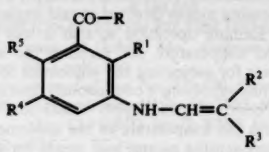
Filed Oct. 20, 1976, Ser. No. 734,478

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1975, 2550519

Int. Cl.² A01N *5/00, 9/20;* **C07C** *101/54, 121/78*

U.S. Cl. 71—76 **22 Claims**

1. Chlorine-substituted vinylaminobenzoic acid compound of the formula



(I)

in which

R is hydroxyl, alkoxy of from 1 to 4 carbon atoms or monoalkylamino of from 1 to 3 carbon atoms,

R^1, R^4 and R^5 are individually selected from hydrogen and chlorine, provided that at least one of R^1, R^4 and R^5 is chlorine,

R^2 is alkylcarbonyl of from 1 to 4 carbon atoms in the alkyl moiety or carbalkoxy of from 1 to 4 carbon atoms in the alkoxy moiety; and

R^3 is cyano, alkylcarbonyl of from 1 to 4 carbon atoms in the alkyl moiety or carbalkoxy of from 1 to 4 carbon atoms in the alkoxy moiety.

19. Method of influencing plant growth which method comprises applying to plants or their habitat an effective amount of a chlorine-substituted vinylaminobenzoic compound as claimed in claim 1.

4,104,050
ACETIMIDIC (α-DIARYLOXYPHOSPHINYLMETHYLAMINO) ACID ESTER HYDROCHLORIDES, HERBICIDAL COMPOSITION AND HERBICIDAL USE THEREOF

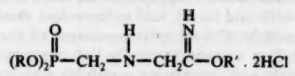
Gerard A. Dutra, Ladue, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jun. 20, 1977, Ser. No. 807,953

Int. Cl.² A01N *9/36;* **C07F** *9/40*

U.S. Cl. 71—86 **30 Claims**

1. A compound of the formula



wherein R is phenyl or a lower alkyl substituted phenyl group said lower alkyl containing 1 to 4 carbon atoms and R' is a primary or secondary alkyl group containing 2 to 10 carbon atoms, cyclohexyl, phenyl or a lower alkyl, lower alkoxy or chlorosubstituted phenyl group said lower alkyl and lower alkoxy containing 1 to 4 carbon atoms.

11. A herbicidal method which comprises applying to plants a herbicidally effective amount of a compound of claim 1.

4,104,051
SUBSTITUTED BROMO- OR CHLORO-ACETAMIDE HERBICIDES

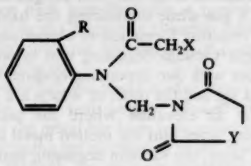
Jiin Duey Cheng, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 667,279, Mar. 15, 1976, Pat. No. 4,055,410. This application Aug. 1, 1977, Ser. No. 820,883

Int. Cl.² A01N *9/22;* **C07D** *233/72*

U.S. Cl. 71—92 **12 Claims**

1. A compound of the formula:



where

R is alkyl or alkoxy of 1 to 4 carbon atoms;

X is chlorine or bromine; and

Y is N—CH_3.

5. A composition for the control of undesirable vegetation consisting essentially of a herbicidally effective amount of a compound of claim **1** and at least one of (a) a surface-active agent or (b) a solid or liquid diluent.

4,104,052

PLANT GROWTH REGULANTS

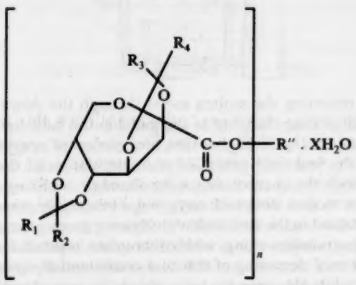
William Szkrybalo, Verona, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 481,265, Jun. 20, 1974, Pat. No. 3,981,860, which is a continuation-in-part of Ser. No. 344,657, Mar. 26, 1973, abandoned. This application Feb. 13, 1976, Ser. No. 657,916

Int. Cl.² A01N 9/00

U.S. Cl. 71—88 **56 Claims**

1. A plant growth regulating composition comprising inert growth regulating adjuvant and, as the active ingredient, an amount effective in regulating plant growth of a compound of the formula:



wherein, when *n* is 1, R″ is hydrogen, sodium, potassium, ammonium, substituted ammonium, straight or branched chain alkyl of from 1 to 12 carbon atoms, straight or branched chain lower alkenyl, straight or branched chain lower alkynyl, or halo-lower alkyl and, when *n* is 2, R″ is calcium or lower alkylene; R_1, R_2, R_3 and R_4 are hydrogen, straight or branched chain, lower alkyl, straight or branched chain lower alkenyl, straight or branched chain lower alkynyl, halo-lower alkyl, phenyl, (lower alkoxy) phenyl or R_1 and R_2 together and R_3 and R_4 together are each a saturated ring containing from 3 to 8 carbon atoms and wherein the combination of the substituents of R_1 and R_2 is the same as the combination of the substituents of R_3 and R_4; *n* is an integer from 1 to 2 and X is a number from 0 to 1.

4,104,053

3-BENZYL-2-METHYLIMINO-5-PHENYL-Δ^4-1,3,4-THIADIAZOLINES AND METHOD OF COMBATING UNDESIRED PLANT GROWTH

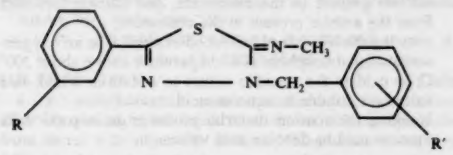
Norman A. Dahle, deceased, late of Lenexa, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Sep. 4, 1974, Ser. No. 503,211

Int. Cl.² A01N 9/22

U.S. Cl. 71—90 **11 Claims**

1. The method of combating weeds in grain fields which comprises applying to the area where the combating effect is desired a herbicidally effective amount of a compound of the formula



in which R is methyl or chloro and R′ is hydrogen, methyl, trifluoromethyl, chloro or fluoro, said compound being applied either in unmodified form or in the form of a salt with an acid in combination with an inert carrier.

4,104,054

N^1-CHLORO-3,5-DINITROSULFANILAMIDES

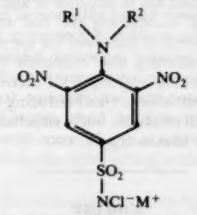
James Richard Beck, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 9, 1976, Ser. No. 748,856

Int. Cl.² A01N 9/14

U.S. Cl. 71—103 **21 Claims**

1. A compound having the formula



wherein each of R^1 and R^2 is independently C_1–C_6 alkyl, C_2–C_4 alkenyl, halo C_1–C_6 alkyl or cyclopropylmethyl; and M is sodium or potassium.

9. A pesticidal composition comprising a compound of claim **1** and a carrier.

16. A method for the control of undesired vegetation in an area which comprises applying to said area a herbicidally effective amount of a compound of claim **1**.

19. A method for reducing the incidence and severity of grape downy mildew which comprises applying to the foliage of the host plant a fungicidally effective amount of a compound of claim **1**.

4,104,055
PROCESS FOR WORKING UP COPPER CEMENTATE SLUDGES

Karl Lippert, and Heinz Planken, both of Duisburg, Germany, assignors to Duisburger Kupferhutte, Duisburg, Germany

Filed Mar. 18, 1974, Ser. No. 452,484

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1973, 2315614

Int. Cl.[2] C22B *1/00, 1/11*

U.S. Cl. 75—1 R 9 Claims

1. A process for recovering metallic values from arsenic-containing copper cementate sludges, which comprises:

a. admixing the cementate with lime in an amount sufficient to form calcium sulfate by reaction with any water-soluble sulfates present in the cementate, and calcium arsenate from the arsenic present in the cementate,

b. roasting the admixture produced in step (a) in an oxygen-containing atmosphere at a temperature above about 300° C, to oxidize the metallic values to a state in which said values are soluble in aqueous acid,

c. leaching the roasted material produced in step (b) with aqueous acid to dissolve said values.

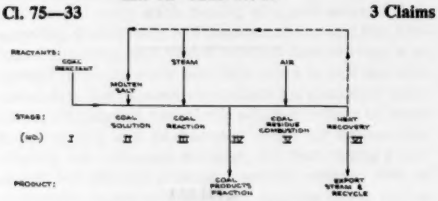
4,104,056
ORE REDUCTION USING MOLTEN SALTS

Frank B. Cramer, Mission Hills, Calif., assignor to Clean Energy Corporation, Los Angeles, Calif.

Division of Ser. No. 512,539, Oct. 7, 1974, Pat. No. 3,966,583. This application Dec. 29, 1975, Ser. No. 644,712

Int. Cl.[2] C21B *13/00*

U.S. Cl. 75—33 3 Claims



1. In the process of sequentially hydrogenating carbonaceous solid fuel reactant with in situ steam derived hydrogen to produce hydrocarbons and a fuel reactant residuum, comprising recovering produced hydrocarbons, and oxidizing the fuel reactant residuum to produce heat energy by mixing said fuel reactant in a molten inorganic halide salt to form a solution of the fuel reactant in said salt in advance of and for the hydrogenation reaction and maintaining the fuel reactant residuum from the hydrogenation so dissolved for the oxidation thereof; the improvement effecting said oxidation by ore reduction which comprises adding a group VIII metal ore to said fuel reactant residuum-salt solution and reducing said ore to metal by reaction with said residuum while simultaneously oxidizing said ore to produce heat energy.

4,104,057
METHOD FOR MAKING LOW CARBON HIGH CHROMIUM ALLOYED STEELS

Hermann Maas, Niermannsweg 11, Gelsenkirchen, and Franz-Josef Hahn, Gabelsberger Str. 9, Dortmund, both of Germany

Division of Ser. No. 685,771, May 12, 1976, abandoned, and a continuation of Ser. No. 366,491, Jun. 4, 1973, abandoned. This application Jun. 4, 1976, Ser. No. 692,758

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1972, 2228462

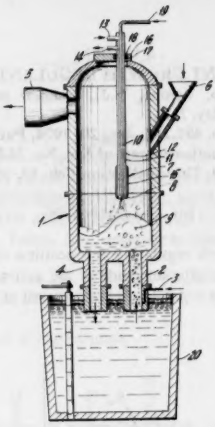
Int. Cl.[2] C21C *7/10;* C22C *33/00*

U.S. Cl. 75—49 5 Claims

1. In the process of producing a high chromium, low carbon alloy steel from a melt of high chromium, high carbon steel through the oxidation of carbon with oxygen and the removal of CO and CO_2 gas while minimizing the oxidation of chromium and the resulting formation of chromium slag, by positioning a recycle vacuum degassing unit in which there is a vacuum chamber with two depending open-ended legs, one of which is a riser leg and the other of which is a down leg with the chamber at an elevation where the said legs project through said slag layer into the molted metal in the ladle beneath said slag layer, the vacuum degassing unit having means maintaining upward flow of molten metal in the riser leg and sufficient vacuum in the degassing chamber that there is an area of turbulence at the surface of the molten metal in the degassing chamber where the metal from the riser enters said chamber and having a lance in the top thereof and adjustable vertically above said area of turbulence, the steps comprising:

(a) charging a melt of high chromium, high carbon steel with its attendant slag into an open top ladle exposed to the ambient air where the slag forms a protective covering over the molten metal against exposure of the molten metal to the ambient air;

(b) then continuously circulating molten steel substantially free of slag from a level below the slag in the ladle upwardly through the riser leg of the recycle vacuum degassing chamber which is maintained throughout the operation under a partial vacuum and from the degassing cham-



ber returning the molten metal through the down leg of the degassing chamber to the metal in the ladle below the covering slag through a first time period of operation;

(c) in the first time period of such circulation of the metal through the vacuum degassing chamber oxidizing carbon in the molten steel with oxygen gas inherently present and contained in the steel and withdrawing gases generated by such oxidation along with other gases emitted from the steel until degassing of the steel is substantially completed and while elevating the lance above the area of turbulence to a level where it is substantially free of being splashed by the metal;

(d) immediately following the first time period of degassing, continuing the circulation of the molten metal through the degassing chamber, as previously recited, through a second time period while projecting oxygen gas against the turbulent surface of the upflowing molten metal where it enters the degassing chamber through the riser leg and with the lance moved lower to said area of turbulence to thereby then rapidly oxidize the carbon at said surface while oxidation of the chromium in the molten steel is substantially prevented by the rapid displacement of the decarbonized surface metal by reason of the surface turbulence of the incoming metal followed by the quick discharge of the moltem metal after such local exposure to

the oxygen back into the ladle, a partial vacuum being maintained in the degassing chamber during this second time period with the withdrawal of reaction and other gases as produced;

(e) immediately following said second time period of oxidation of the metal with oxygen gas and when the carbon content of the metal has been reduced to a predetermined level, continuing the circulation of the molten metal from the ladle through the vacuum degassing chamber for a third time period but with the oxygen gas discharged from the lance now reduced and diluted with an inert gas while maintaining the volume of the mixture of oxygen and inert gas substantially the same as the volume of oxygen alone in said second time period until a final level of minimum carbon content in the molten metal is reached with the lance again raised to a higher level above said area of turbulence to increase its area of contact with the incoming metal, and while continuing to maintain a partial vacuum in the degassing chamber for this third period of time; and

(f) thereafter terminating the operation of the degassing unit, deoxidizing the molten metal and effecting the required correction of alloying ingredients made and the molten metal then discharged from the ladle.

4,104,058

STEELMAKING

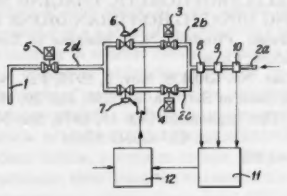
Hugh Willmott Grenfell, and David James Bowen, both of Swansea, Wales, assignors to British Steel Corporation, London, England

Continuation-in-part of Ser. No. 675,795, Apr. 12, 1976, abandoned. This application Dec. 23, 1976, Ser. No. 753,793

Claims priority, application United Kingdom, Apr. 11, 1975, 15039/75

Int. Cl.² C21C *5/30*

U.S. Cl. 75—60 **12 Claims**



1. A method for enabling the refining of a molten steelmaking charge to be ceased when the temperature of the steel is at a desired value, the method comprising the steps of:

(a) injecting oxygen into the molten steelmaking charge,

(b) measuring the weight of the vessel at time *t*,

(c) measuring the weight of the vessel at time $t + dt$,

(d) measuring dw/dt where dw/dt is the weight change of the charge in time increment dt,

(e) determining dc/dt from the equation $dc/dt = [(dOt/dt) - (dw/dt)]/2.33$ where dc/dt is the rate of decarburisation, dOt/dt is the rate at which oxygen is being supplied to the charge and 2.33 is the ratio molecular weight CO: molecular weight C,

(f) determining dOs/dt from the equation $dOs/dt = dw/dt + dc/dt$ where dOs/dt is the rate at which oxygen enters the steelmaking slag,

(g) inserting the values of dc/dt and dOs/dt in the equation: charge weight × [(heat content of the charge at time $t + dt$) − (heat content of the charge at time t)] = dc/dt × heat of combustion of C + dOs/dt × molecular weight factor to convert O content to Fe content used in combustion × heat of combustion of Fe − $d(W.G.)/dt$ × waste gas heat content − $d(H.L.)/dt$ where $d(W.G.)/dt$ is the rate at which waste gas is produced and $d(H.L.)/dt$ is the rate at which unaccountable heat losses occur,

(h) determining from the equation the temperature of the charge at time $t + dt$,

(i) repeating steps (a) to (h) above for further time increments dt until the desired value of the molten steel temperature has been determined, and

(j) ceasing oxygen injection at the time corresponding to the time at which the molten steel reaches the desired temperature.

4,104,059

MOLYBDENUM-TITANIUM-ZIRCONIUM-ALUMINUM MASTER ALLOYS

Frederick H. Perfect, Wyomissing, Pa., assignor to Reading Alloys, Inc., Robesonia, Pa.

Filed May 27, 1977, Ser. No. 801,086

Int. Cl.² C22C *21/00*

U.S. Cl. 75—134 F **3 Claims**

1. A molybdenum-titanium-zirconium-aluminum master alloy comprising from about 35 to about 40% molybdenum, from about 1 to about 5% titanium, from about 15 to about 25% zirconium, balance aluminum, said alloy containing not more than about 0.004%, by weight, nitrogen.

4,104,060

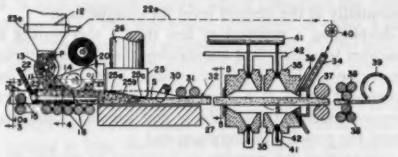
SOLID-PHASE CONVERSION OF PARTICULATE METAL INTO CONTINUOUS STRIP

Herbert G. Johnson, 17 N. Drexel Ave., Havertown, Pa. 19083

Continuation-in-part of Ser. No. 557,394, Mar. 11, 1975, abandoned. This application Nov. 23, 1976, Ser. No. 744,435

Int. Cl.² B22F *3/12, 9/00*

U.S. Cl. 75—208 CS **18 Claims**



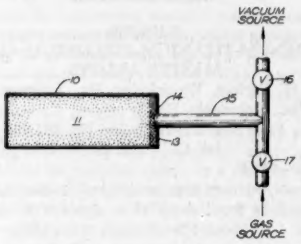
1. The method of converting particulate metal into continuous strip without melting, which comprises, feeding into a feeding enclosure a plurality of sheet metal jacket components which together will form a complete jacket around a core of metal particles, feeding particulate metal to form a core between the advancing jacket components, feeding a protective gas under pressure between the jacket components and into the particulate metal to purge the air from said particulate metal and from said feeding enclosure, bringing the jacket components together to form a complete gas-retaining jacket over the core of particulate material, and compacting the composite strip of core and jacket while still filled with protective gas under pressure, with some of the gas in the composite strip being forced back by the compacting action toward the feeding enclosure.

12. Apparatus for continuously converting particulate metal material into strip of indefinite length without melting, comprising in combination, means for sealingly feeding to a feeding enclosure filled with protective gas under pressure a plurality of metal jacket sheet components which together form a longitudinally and circumferentially complete jacket around the metal core of the strip, means for sealingly feeding particulate metal material between the jacket components in the feeding enclosure, the jacket sheet components as fed in forming a complete enclosure over a core of material, means for injecting air-purging protective gas into the particulate metal, and means for compacting the jacketed strip as it moves along after the jacket components have been closed over the core material and while the interior of the jacketed strip is still in communication with the protective gas within the feeding enclosure.

4,104,061
POWDER METALLURGY

Sidney G. Roberts, Livermore, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Oct. 21, 1976, Ser. No. 734,575
Int. Cl.[2] B22F 3/00
U.S. Cl. 75—211 36 Claims



1. A method of preparing essentially porosity free powder metallurgical products comprising:

(a) subjecting powdered metal or a porous compact thereof to a plurality of treatment cycles to remove volatile and gaseous contaminants, each of said cycles comprising a vacuum treatment of the powder or compact followed by infusion thereof with a depurative gas;

(b) controlling the temperature of the environment surrounding the powder or compact during said treatment cycles to above 400° F and increasing said temperature during said cycles so that upon completion of the treatment cycles the temperature of the powder or compact is essentially at the desired level for compacting;

(c) developing a pressure of less than 5 torr during each vacuum treatment and maintaining the pressure during at least one of the vacuum treatments following the initial treatment cycle at a level sufficiently below 5 torr to remove essentially all volatile and gaseous contaminants from the powder or compact; and

(d) compacting the powder or compact to essentially full density.

4,104,062
PROCESS FOR MAKING ALUMINUM MODIFIED BORON CARBIDE AND PRODUCTS RESULTING THEREFROM

Gerald Q. Weaver, Princeton, Mass., assignor to Norton Company, Worcester, Mass.

Filed Aug. 13, 1969, Ser. No. 849,927
Int. Cl.[2] B22F 3/00
U.S. Cl. 75—238 8 Claims

1. A process of forming boron carbide-aluminum reaction products comprising:

uniformly blending 70–97% by weight of powdered boron carbide with 3–30% by weight of powdered metallic aluminum;

wetting the blended boron carbide-aluminum mixture with temporary organic binder contained in a vehicle;

volatilizing the vehicle for said temporary organic binder;

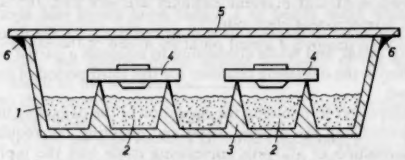
preforming and densifying said boron carbide-aluminum-organic binder mixture with pressure at a temperature below 200° C;

hot-pressing said preform at a pressure of at least 500 psi at a temperature of from 1800° to 2300° C in an atmosphere substantially free of oxygen.

4,104,063
FORMED PART OF SINTERED IRON AND METHOD AND SINTERING TILE FOR MAKING SAME

Dieter Pohl, Aalen, and Franz Redlinger, Kuchen, both of Fed. Rep. of Germany, assignors to Schwäbische Hüttenwerke Gesellschaft mit beschränkter Haftung, Wasseralfingen, Fed. Rep. of Germany

Continuation of Ser. No. 419,346, Nov. 27, 1973, abandoned. This application Oct. 18, 1976, Ser. No. 733,268
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1972, 2258310
Int. Cl.[2] B22F 3/00
U.S. Cl. 75—243 3 Claims

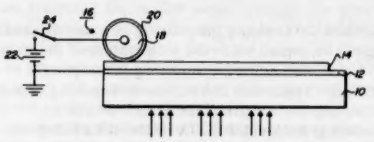


1. A part formed of sintered iron body having a wear-resistant surface layer of an austenitic steel which has manganese added to the material of said layer, so that said surface layer has a greater proportion of manganese than remainder of the body of said part, said surface layer constituting exclusively a manganese diffusion alloy purely of austenitic steel and also being cold deformed for greater hardness than said body.

4,104,064
PHOTOELECTROPHORETIC IMAGING METHOD EMPLOYING DINAPHTHO-FURAN-DIONE PIGMENTS

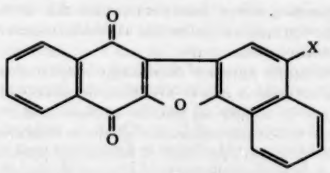
Robert J. Gruber, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 630,479, Nov. 5, 1975, Pat. No. 4,017,311, which is a division of Ser. No. 492,555, Jul. 29, 1974, Pat. No. 3,957,829. This application Oct. 15, 1976, Ser. No. 732,580
Int. Cl.[2] G03G 17/04
U.S. Cl. 96—1 PE 6 Claims

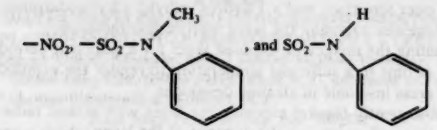


1. A photoelectrophoretic imaging method comprising the steps of

(a) applying a layer of an imaging suspension comprising an electrically photosensitive pigment particle represented by the general formula



wherein X is defined as a member selected from the group consisting of



in an electrically insulating carrier liquid, between a pair of electrodes, at least one of which is transparent;

(b) subjecting said suspension layer to an electrical field; and substantially simultaneously therewith

(c) exposing said suspension layer to an imagewise pattern of activating electromagnetic radiation to which at least a portion of said pigment particles are sensitive, through said transparent electrode;

whereby an image is formed on at least one of the said electrodes.

4,104,065

PROCESS FOR PREPARATION OF PHOTOCONDUCTIVE POWDERS OF CADMIUM SULFIDE TYPE MATERIALS

Noriyoshi Tarumi, Tama; Akihiko Tamura, and Masakazu Kokiso, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1977, Ser. No. 777,124

Claims priority, application Japan, Mar. 16, 1976, 51-27686

Int. Cl.[2] G03G *5/04*

U.S. Cl. 96—1.5 R **2 Claims**

1. A process for preparing photoconductive powders having improved photosensitive properties which consists of forming a mixture of a powdered photoconductive material selected from the group consisting of cadmium sulfide, cadmium selenide, cadmium sulfide selenide, and zinc oxide with an effective amount of a donor material and an activator, adding to the resulting mixture at least about 20% by weight of the photoconductive material of a water soluble dispersant selected from the group consisting of sodium chloride, sodium sulfate, cadmium sulfate, potassium chloride, anhydride of magnesium chloride, anhydride of cadmium chloride, anhydride of cobalt chloride, barium chloride, sodium bromide, potassium bromide, anhydride of cadmium bromide, anhydride of cobalt bromide, sodium iodide, potassium iodide, barium iodide and potassium carbonate, then firing the mixture in the presence of oxygen at a temperature selected from about 400° to about 800° C. at which temperature the dispersant does not melt and finally removing the dispersant to obtain a finely divided photoconductive powder.

4,104,066

COLD PRESSURE FIX TONERS FROM POLYCAPROLACTONE

Meurig W. Williams, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 1, 1976, Ser. No. 662,629

Int. Cl.[2] G03G *9/10, 13/08, 9/08*

U.S. Cl. 96—1 SD **21 Claims**

1. A pressure-fixable toner capable of being fixed to a support medium in image configuration by the application of pressure comprising a colorant and a material selected from the group consisting essentially of polycaprolactone polymer, polycaprolactone polymer blends and polycaprolactone copolymers, wherein said polycaprolactone polymer has a number average molecular weight of between about 2,000 and about 15,000, said polycaprolactone blends comprise greater than about 50 percent by weight of polycaprolactone and said polycaprolactone copolymers comprise block copolymers having a number average molecular weight of between about 2,000 and about 15,000.

4,104,067

POLYMER BINDER

Werner Krafft, Leverkusen; Günther Arnold, Ulm; Gabor Paal, Stuttgart, and Hans-Peter Vollmer, Ulm, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, AG, Leverkusen, Fed. Rep. of Germany

Filed Jan. 23, 1975, Ser. No. 543,273

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1974, 2404042

Int. Cl.[2] G03G *5/04*; B32B *27/36*

U.S. Cl. 96—1.5 R **5 Claims**

1. An improved recording material sensitive to UV-radiation comprising a film substrate and a binder layer adhered to a surface of said substrate containing at least one substance which is capable of discoloration on response to UV-radiation.

wherein the improvement comprises a binder layer transparent to UV-radiation consisting essentially of a copolymer of 33%-91% by weight of methyl methacrylate and 67%-9% by weight of alkyl acrylate or alkyl methacrylate, the alkyl group of the alkyl acrylate or alkyl methacrylate containing from 2 to 6 carbon atoms,

said binder layer on said substrate being flexible as a recording material and free from hair cracks after over 1000 flexures over curved surfaces of radii ranging from 15-24 mm.

4,104,068

SILVER HALIDE EMULSIONS CONTAINING MICROVOIDS

Karl J. Schreiber, Waban, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 16, 1977, Ser. No. 769,171

Int. Cl.[2] G03C *7/00, 1/48, 1/02, 1/84*

U.S. Cl. 96—3 **14 Claims**

14. A photographic process which comprises the steps of:

(a) Exposing a film unit which comprises, in order, a support carrying an additive multi-color screen, a silver precipitating layer, a layer comprising photosensitive silver halide crystals and microvoids less than one micron average diameter and adapted to scatter light incident on said layer comprising silver halide crystals, said microvoids comprising at least about 25% by volume of said layer comprising silver halide crystals; and

(b) contacting exposed film unit with an aqueous alkaline photographic processing composition to develop said exposed silver halide emulsion and to form a silver transfer image in said silver precipitating layer and to collapse said microvoids.

4,104,069

METHOD OF DETERMINING EXPOSURE TIMES FOR PHOTOGRAPHIC COPYING MATERIAL

Jacques Leon Vanheerentals, Schoten, Belgium; Josef Pfeifer, Unterhaching, Fed. Rep. of Germany; Helmut Klocke, Pocking, Fed. Rep. of Germany, and Rudolf Paulus, Munich, Fed. Rep. of Germany, assignors to AGFA-Gevaert, AG, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 522,945, Nov. 11, 1974, abandoned. This application Jun. 25, 1976, Ser. No. 699,862

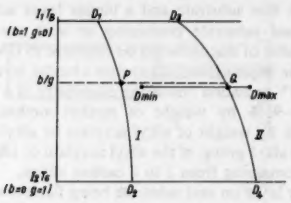
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1973, 2356277

Int. Cl.[2] G03C *7/16, 7/00*; G03B *27/74*

U.S. Cl. 96—23 **1 Claim**

1. A process of forming from an original having respective minimum and maximum density values D_{min} and D_{max} on a copying material an image of the original having respective minimum and maximum density values P and Q, different from D_{min} and D_{max}, comprising the steps of forming a first test wedge image by exposing a first specimen of said copying material to light of a respective first color, the exposure of said first specimen being such that the average exposure time is T_p, with the exposure to light increasing across said first specimen;

forming a second test wedge image by exposing a second specimen of said copying material to light of a respective second color, the exposure of said second specimen being such that the average exposure time is T_G, with the exposure to light increasing across said second specimen; determining from said first test wedge image the density values D_1 and D_3 which an original must have to produce upon said copying material the respective density values P and Q if the copying of such original onto said copying material were performed with said light of said first color for an exposure time T_B; determining from said second test wedge image the density values D_2 and D_4



which an original must have to produce upon said copying material the respective density values P and Q if the copying of such original onto said copying material were performed with said light of said second color for an exposure time T_G; determining from the values enumerated above the values b, g, t_b and t_g, t_b and t_g being the respective exposure time intervals which must be employed for said light of said first and second colors to form from an original having said respective minimum and maximum density values D_{min} and D_{max} on said copying material an image of the original having said respective minimum and maximum density values P and Q and where $b = t_b/(t_b + t_g)$ and where $g = t_g/(t_b + t_g)$, by solving the equation

$$10^{(D_{max} - D_{min})} = \frac{b^{p_1} \cdot 10^{D_3} + g^{p_2} \cdot 10^{D_4}}{b^{p_1} \cdot 10^{D_1} + g^{p_2} \cdot 10^{D_2}}$$

for the unknowns b and g using a reiterative numerical method, where p_1 and p_2 are the Schwarzschild exponents for said copying material for the two color exposures employed, by solving for t_b using the equation

$$t_b = T_B \cdot b \cdot \text{antilog}(D_{min} - P),$$

and by solving for t_g using the equation

$$t_g = T_G \cdot g \cdot \text{antilog}(D_{min} - P),$$

forming from said original said image of said original by illuminating said original with said light of said first color and exposing said copying material to such light for a time interval t_b and by illuminating said original with said light of said second color and exposing said copying material to such light for a time interval t_g.

4,104,070

METHOD OF MAKING A NEGATIVE PHOTORESIST IMAGE

Holger Moritz, Holzgerlingen, Fed. Rep. of Germany, and Gabor Paal, Fishkill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 3, 1976, Ser. No. 682,804

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1975, 2529054

Int. Cl.[2] G03C *5/00*

U.S. Cl. 96—36 **5 Claims**

1. A method of making a negative photoresist image on a substrate consisting essentially of the steps of:

Applying to a substrate a layer of a positive working photoresist material consisting essentially of a phenolformaldehyde resin, a naphthoquinone (1,2) diazide sulfonic acid ester sensitizer, and a 1-hydroxyethyl-2-alkylimidazoline,

imagewise exposing the layer with actinic radiation,

heating the imagewise exposed layer for a sufficient period of time to a sufficient temperature to render the exposed areas insoluble in alkaline developer,

subsequently blanket exposing the layer with actinic radiation and, removing the portions of the layer which were not exposed during the imagewise exposure with an alkaline developer.

4,104,071

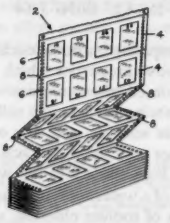
METHOD FOR ORGANIZING AND PREPARING PHOTOGENERATED PRINTING MEDIA

Robert J. Crissy, West Caldwell, N.J., assignor to Powers Chemco, Inc., Glen Cove, N.Y.

Filed Oct. 13, 1972, Ser. No. 297,367

Int. Cl.[2] G03C *5/04*; G03B *27/44*

U.S. Cl. 96—41 **1 Claim**



1. A method for preparing proof copy page lay-outs for multi-page printing comprising the steps of recording at predetermined spaced intervals on a film the page sequence in which such pages are to be printed, advancing a conveyer sheet through a first conveyer sheet holder and stopping said sheet in said first holder after a predetermined length of said conveyer sheet has been advanced, advancing said recorded film a predetermined length to expose said film for viewing of the intervals of said page printing sequence and stopping said film, after stopping the advance of said conveyer sheet and said film affixing to said conveyer sheet at pre-determined intervals across said conveyer sheet and in the sequence exposed for viewing on said film the proof copy pages of the pages to be printed, after said proof copy pages have been affixed to said conveyer sheet, advancing said conveyer sheet with said proof copy pages affixing thereto through a second conveyer sheet holder and stopping said conveyer sheet in said second conveyer sheet holder after a pre-set segment length of said conveyer sheet has been advanced through said second sheet holder, advancing a pre-set length of photosensitive film and stopping said photosensitive film and, after each pre-set segment of said conveyer sheet and said pre-set length of said pre-set length of said photosensitive film have been advanced and while said conveyer sheet is stopped in said second sheet holder and said photosensitive film is stopped, reproducing the images of said proof copy pages affixed to said conveyer sheet onto said photosensitive film and, thereafter, reproducing the images of said proof page copy on said photosensitive film onto a printing plate for use in said multi-page printing.

4,104,072

WATER DEVELOPABLE LITHOGRAPHIC PRINTING PLATE HAVING DUAL PHOTOSENSITIVE LAYERING

Eugene Golda, Monsey; Alan Leonard Wilkes, Brewster, and Simon Long Chu, Dobbs Ferry, all of N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed May 19, 1977, Ser. No. 798,531
Int. Cl.[2] G03C *1/76, 1/52*
U.S. Cl. 96—68 20 Claims

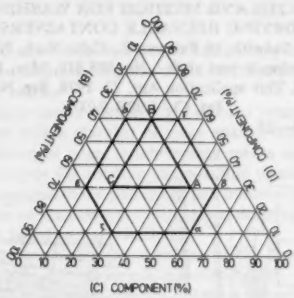
13. A method of producing a lithographic printing plate which comprises first applying a water soluble, lithographically suitable, light sensitive aromatic diazo substance as a first layer to at least one surface of a metal sheet substrate and secondly applying to said layer, a second layer of a water insoluble, ink receptive photosensitive composition which comprises a water permeable, water insoluble, oleophilic resin and a lithographically suitable photosensitizer selected from the group consisting of the reaction product of the paradizo diphenylamineparaformaldehyde condensate with 2-hydroxy-4-methoxy benzophenone sulfonic acid, the azido pyrenes, aromatic diazo oxides, polyacetals which depolymerize under ultraviolet radiation, polymonochloroacetaldehyde, polypropionaldehyde, poly-n-butyraldehyde, poly-cyanopentaldehyde, polycyanovaleraldehyde, poly-n-butyraldehyde, polyisobutyraldehyde, polyvaleraldehyde and polyheltaldehyde, said water soluble, lithographically suitable, light sensitive substance and said water insoluble, ink receptive photosensitive composition are characterized as being either both positive working or both negative working.

4,104,073

FIRE RETARDANT INTUMESCENT PUTTY

Yooichi Koide; Tamotsu Kaide; Michio Takada, and Keiji Ichikawa, all of Amagasaki, Japan, assignors to Dainichi-Nippon Cables, Ltd., Japan

Filed May 14, 1976, Ser. No. 686,964
Claims priority, application Japan, May 16, 1975, 50-58936; May 16, 1975, 50-58937; Sep. 22, 1975, 50-115002; Sep. 22, 1975, 50-115003
Int. Cl.[2] C09D *5/18*
U.S. Cl. 106—15 FP 22 Claims



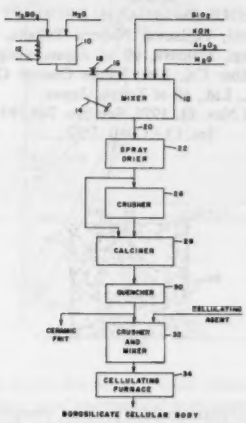
1. A fire retardant intumescent putty having a cone penetration value of 2-40 (mm/150 g, 5 sec., at 20° C) determined in accordance with JIS A 5752-1966, which comprises (a) at least 4% by weight of an organic material which is a semi-solid or liquid at room temperature and has a viscosity of 50-100,000 c.st. at 210° F, (b) at least 13% by weight of a nitrogen-containing phosphate which contains at least 7% by weight of phosphorus and corresponds in structure to a phosphoric acid represented by the general formula, $(xH_2O \cdot yP_2O_5)n$, wherein $0 < (x/y) \leqq 3$ and n is 1-14, one or all of the hydrogen atoms of which are substituted with at least one mono-, di-, or trivalent nitrogen-containing group consisting essentially of nitrogen and either or both of hydrogen and carbon, and (c) lubricating grease wherein said grease is in the form of a viscous paste or semi-solid at room temperature, has a cone penetration value of about 40–500 determined in accordance with JIS K 2560-1969, and comprises a thickener and a natural or synthetic oil which is nonvolatile at room temperature.

4,104,074

PULVERULENT BOROSILICATE COMPOSITION AND A METHOD OF MAKING A CELLULAR BOROSILICATE BODY THEREFROM

David Rostoker, Monroeville, Pa., assignor to Pittsburgh Corning Corporation, Pittsburgh, Pa.

Division of Ser. No. 685,054, May 10, 1976. This application Aug. 18, 1977, Ser. No. 825,840
Int. Cl.[2] C03B *1/00*
U.S. Cl. 106—40 V 4 Claims



1. A pulverulent borosilicate composition consisting essentially of an admixture of silica, alumina, boric acid and an alkali metal hydroxide in which,

said boric acid is in the form of B_2O_3 and said alkali metal hydroxide is in the form of K_2O, and

said composition contains between about 80 and 88 percent by weight SiO_2, between about 7 and 13 percent B_2O_3, between about 1 and 3 percent by weight K_2O and about 4 percent Al_2O_3.

4,104,075

REFRACTORIES, BATCH FOR MAKING THE SAME AND METHOD FOR MAKING THE SAME

Takeshi Hayashi, Bizen; Masao Shibuno, Okayama; Chokei Sawaki, Bizen, and Susumu Okazaki, Okucho, all of Japan, assignors to Shinagawa Refractories Co., Ltd., Tokyo, Japan

Filed Jan. 13, 1977, Ser. No. 759,242
Claims priority, application Japan, Jan. 26, 1976, 51-6702
Int. Cl.[2] C04B *35/52, 35/56*
U.S. Cl. 106—44 28 Claims

1. A refractory comprising about 30 to 70% by weight of a coarse refractory grain and, as an indispensable ingredient for the coarse refractory grain, a bonded structure comprising about 0.1 to 8.0% by weight titanium nitride, about 0.5 to 30% by weight silicon carbide, and about 1.5 to 55% by weight of alumina, said bonded structure being formed in the refractory.

4,104,076

MANUFACTURE OF NOVEL GREY AND BRONZE GLASSES

André Pons, Villejuif, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation of Ser. No. 495,218, Aug. 6, 1974, abandoned, and a continuation of Ser. No. 124,240, Mar. 15, 1971, abandoned. This application Sep. 8, 1976, Ser. No. 721,509

Claims priority, application France, Mar. 17, 1970, 70.09441

Int. Cl.[2] C03C *3/08, 3/04*

U.S. Cl. 106—52 4 Claims

1. A tinted silica-soda-lime glass consisting in its essential elements, by weight percent, of: SiO_2 60–75%, B_2O_3 0–7%, Al_2O_3 0–5%, $K_2O + Na_2O$ 10–20% of which K_2O is 0–10%, CaO + MgO 6–18% of which CaO is 0–16% and MgO is 0–10%, and containing by weight percent of tinting agents: Fe_2O_3 0.2–1.5%, CoO 0.0010–0.0300%, Se 0–0.0200%, and Cr_2O_3 0.0010–0.0200%.

4,104,077

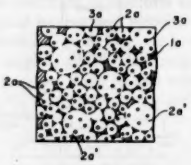
POROUS INORGANIC PRODUCT

Kazuaki Kobayashi, Fujisawa; Noboru Takaha, Tokyo, and Masao Katsuragi, Hamura, all of Japan, assignors to The Yokohama Rubber Co., Ltd.; Nihon Cement Co., Ltd. and Asano Pole Co., Ltd., all of Tokyo, Japan

Filed Nov. 11, 1976, Ser. No. 740,793

Int. Cl.[2] C04B *7/32*

U.S. Cl. 106—88 13 Claims



1. A porous, inorganic, molded product, comprising a matrix of molded, shape-retaining, inorganic binder, said binder having substantially uniformly distributed therein a multiplicity of open interconnecting cells wherein each of said cells has a volume of from 0.52 mm^3 to 4200 mm^3, said open cells being interconnected by holes so that the interconnection coefficient of said product is from 0.5 to 15%, wherein the interconnection coefficient is defined as the sum of the areas of the holes that communicate with the cells that are directly intersected by an imaginary cross-sectional plane through said product divided by the area of that plane, the ratio of

$$\frac{\text{apparent density of said product}}{\text{true density of said binder}}$$

being in the range of 0.15 to 0.5.

4,104,078

METHOD FOR SEPARATION OF DEXTRANS

Philip Edwin Barker, Birmingham; Brian William Hatt, Bromsgrove, and Frederick John Ellison, Liverpool, all of England, assignors to Fisons Limited, London, England

Filed Jun. 2, 1977, Ser. No. 802,783

Claims priority, application United Kingdom, Jun. 16, 1976, 24908/76

Int. Cl.[2] C08B *37/02;* C13L *3/00*

U.S. Cl. 127—46 R 11 Claims

1. A method for separation of a fluid mixture of dextrans of differing molecular weights into two fractions, which comprises

(a) passing said mixture into chromatographic apparatus which comprises a plurality of compartments which contain a chromatographic packing material, valve-containing conduits interconnecting the compartments to provide a closed loop column, at least one additional valve controlled fluid inlet and at least one additional valve controlled fluid outlet for each compartment, and means for sequential operation of the valves, and

(b) operating the valves sequentially such that each compartment undergoes, and at any one time there is at least one compartment undergoing, the following operations:

(i) being fed with the fluid mixture to be separated,

(ii) being fed with a carrier fluid,

(iii) having carrier fluid and any entrained faster moving components of the fluid mixture removed therefrom, and

(iv) being isolated and treated to remove any slower moving components of the fluid mixture; the compartment being fed with fluid mixture to be separated being a compartment through which the carrier fluid passes.

4,104,079

METHOD OF REMOVING SCALE CAUSED BY RAFFINATE IN A PHOSPHORIC ACID PURIFICATION PROCESS

Sakumi Fujii; Masao Uchida, and Osamu Watanabe, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Apr. 11, 1977, Ser. No. 786,191

Claims priority, application Japan, Apr. 16, 1976, 51-42413

Int. Cl.[2] B08B *3/08*

U.S. Cl. 134—2 3 Claims

1. In a method of removing adhered scale which deposits on surfaces of process apparatus when said surfaces are in contact with a raffinate obtained by extracting wet process phosphoric acid with an organic solvent or a mixture of an organic solvent and a strong acid, the improvement which comprises contacting said scale with an aqueous solution having a concentration of greater than 5 wt. % of at least one strong base selected from the group consisting of sodium hydroxide, potassium hydroxide, calcium hydroxide and barium hydroxide for a time sufficient to remove said scale from said surfaces.

4,104,080

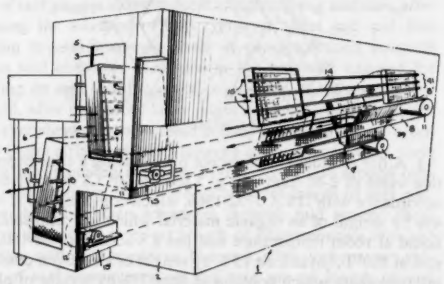
APPARATUS AND METHOD FOR WASHING AND DRYING REUSABLE CONTAINERS

Howard M. Sadwith, 16 Fairway E., Colts Neck, N.J. 07722

Continuation-in-part of Ser. No. 665,819, Mar. 11, 1976, abandoned. This application Apr. 22, 1976, Ser. No. 679,317

Int. Cl.[2] B08B *9/00*

U.S. Cl. 134—23 26 Claims



18. A method for washing and drying reusable container-like articles comprising the steps of:

transporting said articles through a washing station for applying washing fluid thereto;

transporting said articles through a rinsing station for applying rinsing fluid thereto;

flipping said rinsed articles so as to abruptly rotate said

articles end over end to shake a portion of the excess rinsing fluid on said articles therefrom, the flipping of said articles comprising:

pushing said articles onto an inclined chute;

and righting said articles when they reach the end of said chute;

and transporting said flipped articles through a drying station for drying said articles.

4,104,081

IN-LINE BOTTLE RINSER

Roger W. Totten, Littleton, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Aug. 9, 1976, Ser. No. 712,676

Int. Cl.[2] B08B *3/02, 13/00*

U.S. Cl. 134—23 **16 Claims**

1. The method of rinsing bottles, comprising in the order stated:

(a) loading upright bottles into carriers on a conveyor chain traveling in a substantially straight path,

(b) inverting the bottles by pivoting their carriers in a plane perpendicular to the path of the conveyor chain, the carriers retaining the bottles in defined position with respect to the carriers,

(c) spraying rinse liquid into the moving bottles through a varying angle as the inverted bottles approach, pass over, and travel beyond spray means along said straight path,

(d) returning the bottles to upright position by pivoting their carriers in a plane perpendicular to the path of the conveyor, and

(e) unloading upright bottles from the carriers, the loading, inverting, spraying, uprighting, and unloading taking place along said straight path.

9. An in-line rinser for bottles and the like comprising:

(a) a conveyor carrying a succession of bottles in predetermined locations with respect to the length of the conveyor;

(b) spray means for spraying rinse liquid into passing bottles on the conveyor through an angle that varies with respect to each bottle;

(c) said spray means comprising a circular rotatable nozzle manifold with a plurality of spray nozzles mounted in its circumferential edge, synchronizing means connected to the conveyor for rotating the manifold through a spray arc in response to the passage of said predetermined bottle locations of the conveyor, and means delivering a supply of rinse liquid to the manifold;

(d) sealing means covering a portion of the circumferential edge of said circular nozzle manifold; and

(e) means for limiting radially outward movement of the nozzles with respect to said circular nozzle manifold but permitting the nozzles to be pushed radially inwardly by said sealing means.

13. In combination with a conveyor for bottles for use with bottle rinsing means, an improved bottle carrier characterized by the absence of springs and rollers, for use with a necked bottle of predetermined axial height and shape, comprising:

(a) a lengthwise member approximately parallel to and spaced from the vertical axis of a carried bottle and spaced from the side wall of the bottle;

(b) a bottom member substantially perpendicular to the lengthwise member and contacting at least a portion of the bottom of a carried bottle;

(c) a pair of side arms angling obliquely from said lengthwise member toward the carried bottle and contacting the side of the bottle; and

(d) a flexible bottle neck retaining member connected to said lengthwise member and angling acutely toward said bottom member for urging a bottle into the carrier and assisting in retaining the bottle against said bottom and side members, said neck retaining member contacting the bottle between the finish and the bottom of the bottle for improved exposure of the finish to rinse liquid.

4,104,082

LIFTING DEVICE FOR USE IN A LIQUID MEDIUM

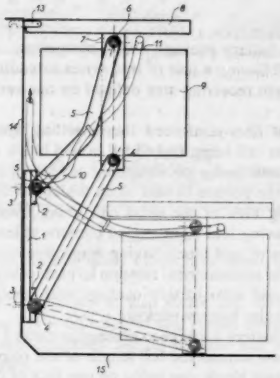
Claude Boujard, 138 Rue Davis Johnston, 33000 Bordeaux, France, and Joseph Vilaldach, 74 Avenue de Verdun, 33200 Bordeaux, France

Filed Feb. 25, 1977, Ser. No. 772,024

Claims priority, application France, Feb. 27, 1976, 7606058

Int. Cl.[2] B08B *13/00;* **B63B** *21/00*

U.S. Cl. 134—141 **15 Claims**



1. A lifting device for use in a liquid medium, comprising:

a substantially parallelepipedical bottomless tank having an upper wall and submergible in the liquid medium

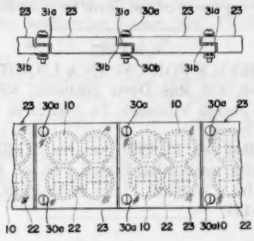
means for introducing air into said tank for driving the liquid out of the tank to raise the tank from the liquid medium and for discharging air from the tank to fill the tank with liquid to lower the tank into the liquid medium; and

guide means for guiding the tank with respect to a side wall of a space containing the liquid medium, during the lowering and the raising of the tank, so that the longitudinal axis of said tank remains parallel to the side wall, said guide means comprising a first pair of parallel arms and a second pair of parallel arms, first corresponding ends of the two arms of the first pair of arms being pivotally mounted with respect to said side wall for pivotal movement about a common first horizontal axis, second corresponding ends of said first pair of arms and being pivotally mounted with respect to the tank for pivotal movement about a second common horizontal axis, first corresponding ends of the two arms of the second pair of arms being pivotally mounted with respect to the said side wall for pivotal movement about a common third horizontal common axis, and second corresponding ends of said second pair of arms being pivotally mounted with respect to the tank for pivotal movement about a common fourth horizontal axis, said tank having its length parallel to said axis and the two arms of each pair of arms being spaced apart horizontally at a distance greater than the length of the tank, said fourth axes being parallel, said first and third axes being spaced apart in the plane of said side wall, and said second and fourth axes being spaced the same distance as said first and third axes in a plane containing the longitudinal axis of the tank and perpendicular to the upper wall of the tank.

4,104,083
SOLAR BATTERY PACKAGE

Taizō Hirano, Tenri, Japan, assignor to Japanese Government, Japan

Filed Apr. 5, 1977, Ser. No. 784,775
Claims priority, application Japan, Apr. 23, 1976, 51-45353
Int. Cl.² H01L *31/04*
U.S. Cl. 136—89 H 8 Claims



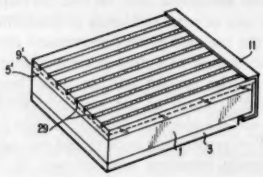
1. A solar battery package which comprises:
a solar cell having a pair of lead wires extending therefrom and a light receiving area defined on one surface thereof; and
a block of fiber-reinforced thermosetting synthetic resin, said solar cell being embedded in said block with the free ends of said lead wires extending outwardly of said block, at least the portion of said block which overlays the light receiving area of the solar cell being transparent, said block having four right-angled corners, at least two opposite sides of said block having respective cutout portions therein in asymmetrical relation to each other for connection of said solar battery package with another similarly shaped solar battery package.

2. A solar battery package as claimed in claim 1 wherein said cutout portions extend the full length of the respective opposite sides of said block, one being on one face of the block and the other being on the other face of the block.

4,104,084
SOLAR CELLS HAVING INTEGRAL COLLECTOR GRIDS

John C. Evans, Jr., N. Olmsted, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 6, 1977, Ser. No. 803,823
The portion of the term of this patent subsequent to Apr. 4, 1995, has been disclaimed.
Int. Cl.² H01L *31/06*
U.S. Cl. 136—89 CC 19 Claims

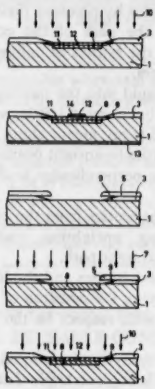


1. A heterojunction or Schottky barrier solar cell which comprises;
a heterojunction or Schottky barrier device, each having opposed upper and lower surfaces;
a conductive base metal layer compatible with and coating predominantly the lower surface of the substrate of each said device such that a back surface field region is formed at the interface between each said device and said base metal layer;
a transparent, conductive mixed metal oxide layer in integral contact with the upper surface of said heterojunction device or said Schottky barrier device and having a metal alloy grid network composed of the same metal elements as the oxide constituents of said mixed metal oxide layer, said network being embedded in said mixed metal oxide layer;
an insulating layer which prevents electrical contact between said conductive metal base layer and said transparent conductive metal oxide layer; and
a metal contact means covering said insulating layer and in intimate contact with said metal grid network embedded in said transparent oxide layer for conducting electrons generated by the photovoltaic process from said device.

4,104,085
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE BY IMPLANTING IONS THROUGH BEVELLED OXIDE LAYER IN SINGLE MASKING STEP

Paul Zandveld, Amsterdam, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 3, 1976, Ser. No. 738,530
Claims priority, application Netherlands, Nov. 11, 1975, 7513161
Int. Cl.² H01L *21/265*
U.S. Cl. 148—1.5 15 Claims



1. A method of manufacturing a semiconductor device in a semiconductor body having a surface at a semiconductor region thereof, comprising the steps of:
(a) providing a first masking layer on said surface of said semiconductor region,
(b) providing a second masking layer on said first masking layer,
(c) providing a window in said second masking layer,
(d) directing toward said layers at a first part of said surface, ions of a dopant material having an energy level such that, outside said window, said first dopant ions being retained entirely by the combined said first and second masking layers and, inside said window, they are retained at most only partly, said ions thus being implanted selectively into said semiconductor region at said first surface part so as to form a first doped semiconductor zone,
(e) subjecting said first masking layer to an etching treatment while using said second masking layer as an etching mask, so that the exposed part of said first masking layer is etched away and form at the edge of the etched-away part thereof a transition region having a thickness increasing towards the exterior of the window,
(f) then directing toward said surface of said semiconductor body ions of a second dopant material, said second dopant

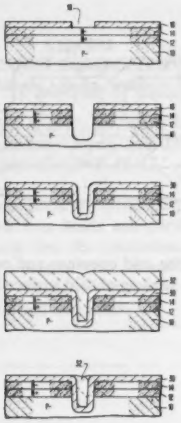
ions having such energy that said second dopant ions are retained entirely by said first masking layer outside said transition region and are retained only partly by at least a part of the transition region, said second dopant ions thus being selectively implanted into said semiconductor region to form a second doped semiconductor zone that adjoins a second part of said surface, said second surface part comprising and entirely surrounding said first surface part.

4,104,086

METHOD FOR FORMING ISOLATED REGIONS OF SILICON UTILIZING REACTIVE ION ETCHING

James Allan Bondur, Walden, and Hans Bernhard Pogge, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,361
Int. Cl.[2] H01L *21/76, 27/00*
U.S. Cl. 148—1.5 **21 Claims**



1. A method for isolating regions of silicon comprising:
providing a silicon body composed principally of one conductivity;
forming tapered sided openings of less than about 4 micrometers in width at the surface in said body by reactive ion etching;
the taper of said tapered sided openings being greater than about 2° from the vertical and terminating into the substantially flat bottom of said openings;
thermally oxidizing the surfaces of said openings;
filling said thermally oxidized openings with a dielectric material wherein the said regions of silicon are isolated; and
removing said dielectric material from above the surface of said body wherein the said openings are uniformly filled at the said surface.

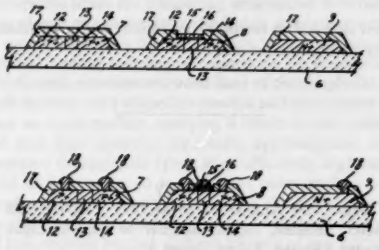
4,104,087

METHOD FOR FABRICATING MNOS MEMORY CIRCUITS

Alfred C. Ipri, Princeton, and Doris W. Flatley, Belle Meade, both of N.J., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 7, 1977, Ser. No. 785,481
Int. Cl.[2] H01L *21/265*
U.S. Cl. 148—1.5 **1 Claim**

1. The method of fabricating an MNOS memory circuit comprising the steps of
fabricating semiconductor islands on a substrate member of non-conducting material to provide stable, memory and tunnel device islands,
depositing a layer of silicon dioxide on said islands and substrate member,
defining a MNOS silicon nitride channel region on said memory device island and removing the silicon dioxide therefrom,
implanting ions into said silicon nitride channel region to a selected memory device thereshold level,
stripping the silicon dioxide layers from the top surfaces of said stable and memory device islands,
growing a thermal oxide layer over the stripped island surfaces,
defining channels on the top surfaces of said stable and memory device islands,
stripping the thermal oxide from stable and memory device



island top surface areas other than areas defining said channels,
effecting P+ diffusion to said stable and memory device islands and N+ diffusion to said tunnel device island,
stripping said deposited silicon dioxide and said thermal oxide layers,
growing a thin oxide layer on the top surface of said memory device island,
depositing a layer of nitride on said layer of oxide,
defining a nitride-thin oxide region on the top surface of said memory device island and removing nitride-thin oxide from non-defined regions thereof,
growing a thick layer of thermal oxide over the surfaces and edges of said stable, memory and tunnel device islands, and
providing said stable, memory and tunnel devices with contact electrodes.

4,104,088

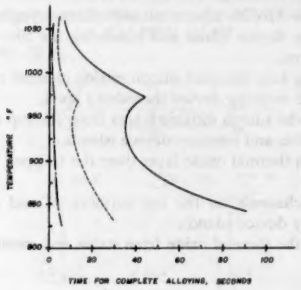
METHOD OF MAKING DIFFERENTIALLY COATED ONE SIDE ALLOYED GALVANIZED STEEL STRIP

Walter Batz, Hopewell Township, Beaver County, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed May 23, 1977, Ser. No. 799,876
Int. Cl.[2] C23C *1/02*
U.S. Cl. 148—12 R **5 Claims**

1. A method for producing a zinc coated and heat-treated sttel substrate, comprising:
passing a low carbon steel substrate through a molten zinc bath containing from 0.15% to 0.18% aluminum so as to form an essentially unalloyed zinc coating on both sides of said substrate; controlling the zinc coating so as to obtain a coating weight of about 0.20 oz./sq.ft. maximum on a first side of said substrate and about 0.30 oz./sq.ft. minimum on a second side; and uniformly heating both sides of

said zinc coated substrate for a time and to a temperature sufficient to form a fully alloyed iron-zinc coating on said



first side and to retain the essentially unalloyed zinc coating on said second side.

4,104,089

DIE-CAST ALUMINUM ALLOY PRODUCTS

Isao Miki, Shimizu, Japan, assignor to Nippon Light Metal Company Limited, Tokyo, Japan

Filed Jul. 8, 1976, Ser. No. 703,654
Int. Cl.[2] C22C *21/02*
U.S. Cl. 148—32.5 **3 Claims**

1. Die-cast aluminum alloy products of high strength, toughness and impact strength and consisting essentially be weight of 7 to 12% of Si, 0.2 to 0.5% of Mg, 0.65 to 1.2% of Fe, 0.55 to 1.0% of Mn and the balance being Al and impurities, said products obtained by die-casting said aluminum alloy while molten into any desired shape by means of a pore-free die-casting process in which oxygen gas is the active gas, cooling the resultant die-castings at a cooling velocity of at least 20° C/sec and subjecting the resultant cooled die-castings to solution heat treatment at a temperature ranging from 450° to 530° C, followed by aging at a temperature ranging from 150 to 230° C.

4,104,090

TOTAL DIELECTRIC ISOLATION UTILIZING A COMBINATION OF REACTIVE ION ETCHING, ANODIC ETCHING, AND THERMAL OXIDATION

Hans Bernhard Pogge, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 24, 1977, Ser. No. 771,593
Int. Cl.[2] H01L *21/76, 27/04*
U.S. Cl. 148—175 **12 Claims**

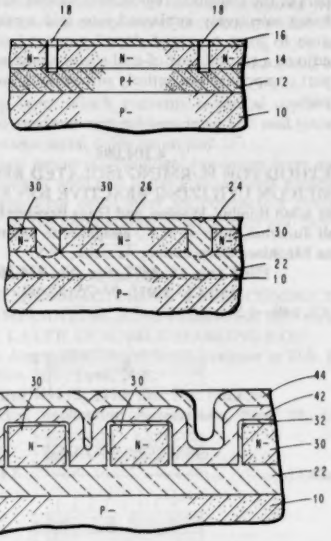
1. A method for forming total dielectric isolation in a silicon structure comprising:

providing a silicon body composed principally of one conductivity, a layer of P+ conductivity thereover and a surface layer of a conductivity other than that of said layer; said body and said surface layer being less highly doped than said P+ layer;

forming openings in said surface layer by reactive ion etching down to the said P+ layer;

anodically etching the body in a hydrofluoric acid solution to selectively convert the said P+ conductivity silicon layer to a layer of porous silicon; and

oxidizing the resultant porous silicon layer to form a silicon oxide layer and oxidizing the silicon in the said surface



layer within the said openings and on its surface to form fully isolated regions of said surface layer.

4,104,091

APPLICATION OF SEMICONDUCTOR DIFFUSANTS TO SOLAR CELLS BY SCREEN PRINTING

John C. Evans, Jr., North Olmsted; Henry W. Brandhorst, Jr., Berea; George A. Mazaris, Brookpark, and Larry R. Scudder, Berea, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 20, 1977, Ser. No. 799,026
Int. Cl.[2] H01L *21/225*
U.S. Cl. 148—188 **6 Claims**

1. An automatable method for doping a solar cell substrate of the flat wafer type having opposed surfaces which comprises

screen printing onto each of said opposed surfaces a layer of a glass-forming chemical containing an electrical-type dopant which molecularly bonds to a resulting glass coating, the dopant in said chemical on one of said surfaces being of a first electrical type and the dopant in said chemical on the opposed surface being of a second electrical type,

heating said printed substrate at a first elevated temperature to remove volatiles from said layer and to dry the same, and

thereafter heating said printed substrate at a second elevated temperature greater than said first elevated temperature to form said glass coating of said opposed surfaces of said substrate, said second elevated temperature being effective to simultaneously diffuse both of the dopants into said substrate.

4,104,092

EMULSION SENSITIZED GELLED EXPLOSIVE COMPOSITION

John J. Mullay, Hazelton, Pa., assignor to Atlas Powder Company, Tamaqua, Pa.

Filed Jul. 18, 1977, Ser. No. 816,858
Int. Cl.[2] C06B *45/00*
U.S. Cl. 149—2 25 Claims

1. An aqueous gel explosive composition comprising up to about 90 percent by weight inorganic oxidizing agents, from about 5 to about 25 percent by weight water, from about 0.2 to about 2.0 percent by weight aqueous gelling agents, from 0.2 to about 10% by weight bulking agents, in the gel portion, and from about 1 to about 80 percent by weight of an explosive emulsion comprising a continuous carbonaceous fuel phase and a discontinuous aqueous phase, said emulsion uniformly distributed in said gel portion.

4,104,093

THERMIT COMPOSITION

Nobuyoshi Yamaji, Akashi, Japan, assignor to Foseco Trading A.G., Switzerland

Filed Mar. 4, 1977, Ser. No. 774,368
Claims priority, application Japan, Jun. 23, 1976, 51-74929
Int. Cl.[2] C06B *33/12*
U.S. Cl. 149—40 4 Claims

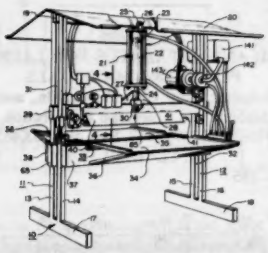
1. In a thermit composition comprising a particulate oxidizable metal, particulate iron oxide and particulate refractory filler, the improvement that the particulate refractory filler comprises zircon and is present in an amount of greater than 35 and up to 50 parts by weight per 100 parts by weight of the easily oxidizable metal and iron oxide.

4,104,094

APPARATUS FOR FORMING CLEATS ON BELTING

Soren E. Peterson, 1649 W. 3300 South, Salt Lake City, Utah 84119

Filed Dec. 17, 1976, Ser. No. 751,262
Int. Cl.[2] B32B *31/14*
U.S. Cl. 156—500 4 Claims



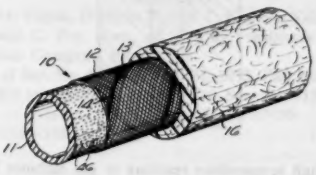
1. Apparatus for affixing cleats to belting including, in combination: a bed; a press disposed over said bed and having a cleat-forming die; first and second, mutually spaced means for heating said die coupled thereto, said bed including a support disposed underneath said die; third means for heating said support, said first, second, and third means each including interior, fluid-containing cavities and electrical heating elements disposed within said cavities; and means for supplying electrical power to said electrical heating elements.

4,104,095

METHOD FOR PRODUCING TUBULAR ARTICLE

William D. Shaw, 4494 Orchard St., Mantua, Ohio 44255

Filed Nov. 17, 1976, Ser. No. 742,694
Int. Cl.[2] B32B *31/26*
U.S. Cl. 156—83 11 Claims



1. A method of forming composite hollow articles with non-collapsible liners for containing destructive materials and an outer sleeve of substantially rigid high strength material in which material forming the liner cannot be directly bonded to the material forming said sleeve, comprising the steps of selecting a preformed seamless extruded liner of thermoplastic material with an inner wall shaped to contain said destructive materials and an outer surface, applying a fabric to said outer surface of said liner material, externally applying heat to said outer surface through said fabric at a sufficiently high rate and a period of time required to melt said outer surface of said thermoplastic material without melting the portions of said thermoplastic material spaced from said surface, said application of heat causing heating without melting of said portions of said thermoplastic material spaced from said surface and causing radial expansion thereof a greater amount than said fabric thereby causing nodules of said melted outer surface to flow radially outward into openings in said fabric to partially enclose said fabric in said melted outer surface while leaving substantial portions of said fabric exposed, cooling said liner to solidify said outer surface and produce a permanent mechanical bond between said fabric and said outer surface of said liner without separate bonding agents, and thereafter enclosing said liner and fabric with said sleeve material causing it to bond to said exposed fabric without bonding to said liner material, said fabric providing substantially the entire interconnection between said liner and said sleeve and providing a sufficient connection to prevent collapse of said liner.

4,104,096

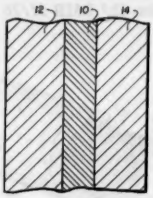
DIFFUSION BARRIER AND SEPARATION SUBSTANCE FOR METAL PARTS ADJOINING EACH OTHER IN AN OXYGEN FREE ATMOSPHERE

Hans Gass, Neuchatel; Hans Erich Hintermann, Ins, and Hartmut Griepentrog, Oberhausen, all of Fed. Rep. of Germany, assignors to Laboratoire Suisse de Recherches Horlogeries, Switzerland and Gutehoffnungshutte Sterkrade Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 601,538, Aug. 4, 1975, Pat. No. 4,072,797.
This application Feb. 18, 1977, Ser. No. 769,881
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1974, 2441260
The portion of the term of this patent subsequent to Feb. 7, 1995, has been disclaimed.
Int. Cl.[2] C01B *21/06, 35/08;* B32B *15/04*
U.S. Cl. 156—89 5 Claims

1. A method of forming a diffusion barrier between first and second metal parts with diffusion barriers therebetween in face to face direct contact with the metal parts comprising forming a protective film from an aqueous suspension of a substance comprising from 5 to 50% of hexagonal boron nitride, from 0.5 to 30% binder, from 2 to 6% of swelling agents and the balance a liquid suspension medium, subjecting the suspension to a burning for from 0.35 to 2 hours at a temperature of from 100° to 500° C.

4. A method of producing a layer which is effective as a separation and diffusion barrier in an oxygen-free inert preferably helium-containing atmosphere between contiguous metal

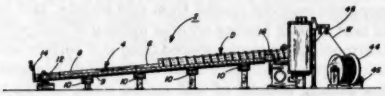


parts and high temperature reactors or gas turbines having a closed circuit, comprising positioning a layer consisting substantially of hexagonal boron nitride between the metal parts in face to face contact with said metal parts.

4,104,097
METHOD FOR MAKING FLEXIBLE DUCT

Raymond A. Gregory, Garfield Heights, and DeWitt Gifford Wilcox, Tallmadge, both of Ohio, assignors to Clecon Incorporated, Cleveland, Ohio

Filed Aug. 5, 1976, Ser. No. 711,797
Int. Cl.[2] B31C *1/00, 5/00*
U.S. Cl. 156—143 **10 Claims**



1. Method for making a flexible, wire-reinforced duct comprising:

providing a stationary mandrel having an endless helical groove corresponding in shape to the cross-sectional shape of a reinforcement wire,

providing a drive belt positioned opposite said groove,

feeding at least one flexible strip wider than and conformable to said groove in helical relation onto said mandrel,

feeding at least one reinforcement wire substantially simultaneously in helical relation over said strip by causing said belt to press said strip into the groove in said mandrel, and overlapping said strip and wire by a covering,

applying adhesive at some time to at least one of said strips and wire to provide a composite unitary structure,

said drive belt has an endless longitudinally spaced groove dimensioned so as to receive the cross-sectional dimension of said reinforcement wire, and wherein the groove in said belt is disposed opposite the groove in said mandrel, and

said wire is fed from the groove in said belt whereby a portion of the wire is disposed within the confines of the mandrel groove.

4,104,098
METHOD AND APPARATUS FOR CURING AND REINFORCING HOSE

James M. Hush, Evergreen, and Donald J. McPhee, Littleton, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Mar. 18, 1977, Ser. No. 779,213
Int. Cl.[2] B65H *81/00*
U.S. Cl. 156—149 **17 Claims**

1. A method of making flexible reinforced tubular articles such as hose having a core formed of curable elastomeric material, comprising:

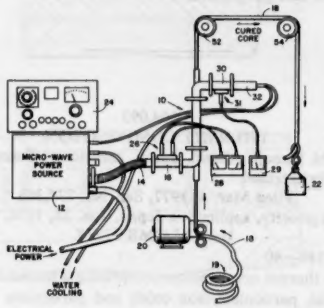
establishing at least one microwave applicator confined zone having an inlet and outlet for passage of an at least partially uncured core;

passing the curable core through the confined zone while substantially simultaneously (a) exposing the core to an applied microwave field, and (b) contacting substantially only the outer surface of the core with a cool stream of fluid within the confined zone, whereby the core becomes substantially cured with the exception of a layer at the outer surface of the core which remains substantially uncured;

twining reinforcement on said uncured outer surface of the core; and

adhering the reinforcement to the core.

13. Apparatus for partially curing flexible curable elastomeric cores useful in the manufacture of reinforced tubular articles such as hose, comprising:



at least one microwave applicator confined zone of generally elongated cylindrical shape and of greater internal cross dimension than the core to be cured, thereby defining an annular zone therebetween, and the confined zone having an inlet and outlet for through passage of an uncured core;

means coupled to the confined zone for supplying a microwave field to the confined zone; and

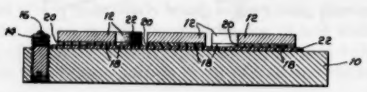
means for contacting the surface of the uncured core with a cooling fluid in the annular zone simultaneously as the core is passed through the confined zone and exposed to the microwave field without using a mandrel as an internal support for the core;

means for twining reinforcement on said core downstream of said confined zone.

4,104,099
METHOD AND APPARATUS FOR LAPPING OR POLISHING MATERIALS

Raymond E. Scherrer, West Palm Beach, Fla., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jan. 27, 1977, Ser. No. 763,451
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—155 **15 Claims**



1. A method for mounting material to be processed to a supporting surface of a processing apparatus wherein a selected surface of the material is to be protected, comprising the steps of:

applying a protective coating to the selected surface of the material; and

disposing a temperature-sensitive material between the protective coating and the supporting surface for securing the

coating to said surface, whereby the protective coating protects the selected surface of the material during the processing and from solvents used to remove the temperature-sensitive material.

3. A method for mounting a semiconductor wafer to the surface of a lapping plate in such a manner as to protect the front face of the wafer during the lapping operation, comprising the steps of:

laminating the front face of said semiconductor wafer to a dry film photopolymer disposed on a carrier sheet; and

securing said carrier sheet over the surface of said lapping plate.

4,104,100
PROCESS FOR ANODIC ELECTRODEPOSITION OF AQUEOUS EMULSIONS

Dale F. Anders, Fox River Grove; Peter V. Brizgys, Chicago; Ronald Mattiuz, Downers Grove, all of Ill., and Edward J. Murphy, Williamsport, Pa., assignors to DeSoto, Inc., Des Plaines, Ill.

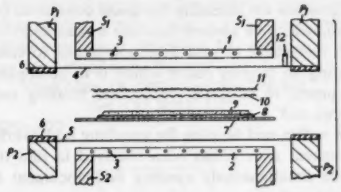
Filed Nov. 12, 1976, Ser. No. 741,386
Int. Cl.[2] C25D *13/08*
U.S. Cl. 204—181 R **14 Claims**

1. A method for electrodepositing a continuous polymer film on a conductive substrate comprising, passing a unidirectional electrical current through an aqueous bath of emulsion copolymer particles and then through said conductive substrate as anode, said emulsion copolymer particles being provided by aqueous emulsion copolymerization of monoethylenically unsaturated monomers in the presence of about 0.5–5% of the weight of materials subjected to copolymerization, of a polyanionic phosphate-based emulsifying agent, and then withdrawing the coated anode from said bath.

4,104,101
PROCESS FOR MAKING A PLASTIC SHEET

Armen Garabedian, 8-22 Astoria Blvd., Long Island City, N.Y. 11102

Continuation of Ser. No. 279,964, Aug. 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 141,495, May 10, 1971, abandoned, which is a division of Ser. No. 805,093, Feb. 14, 1969, abandoned, which is a continuation of Ser. No. 536,140, Mar. 21, 1966, abandoned, which is a continuation-in-part of Ser. No. 473,342, Jul. 20, 1965, Pat. No. 3,383,265. This application Jul. 19, 1977, Ser. No. 817,048
Int. Cl.[2] B29C *17/06*
U.S. Cl. 156—285 **34 Claims**

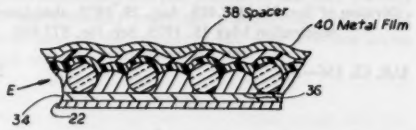


1. The process for producing a piastic sheet having on a major face thereof the characteristics of one surface of a master layer, comprising the steps of disposing on said surface of said master layer a plastic material in comminuted form, disposing over said plastic material a microporous parting element and an air-releasing wire screen means to form a multiple layer sandwich which includes said wire screen means, said parting element, said plastic material, and said master layer, positioning said multiple layer sandwich between two spaced flexible diaphragms, heating said plastic material to at least its fusion temperature, applying a fluid pressure to said diaphragms to evenly impress a fluid-like pressure to said multiple layer sandwich with a force sufficient to cause the plastic material to fuse to a coherent mass defining a plastic sheet as said major face takes on the characteristics of said one surface of the juxtaposed master layer.

4,104,102
METHOD OF MAKING A RETROREFLECTIVE LAMINATE

Beverly M. Eagon, Hudson; Russell L. Carlson, Tallmadge, and Raymond C. Fry, Stow, all of Ohio, assignors to Morgan Adhesives Company, Stow, Ohio

Division of Ser. No. 552,325, Feb. 24, 1975, Pat. No. 4,023,889. This application Aug. 12, 1976, Ser. No. 713,790
Int. Cl.[2] B05D *5/06*; B32B *31/00*
U.S. Cl. 156—298 **3 Claims**

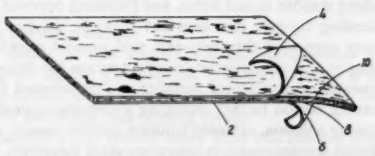


1. In a method of making a retroreflective laminate, the steps of applying a binder layer to a face layer, applying glass beads to the surface of said binder layer and embedding them in such layer but having said glass beads protruding from said binder layer, applying a liquid sealer layer to the surface of the binder layer and the protruding glass beads, drying to obtain a sealer layer that follows the contour of the protruding glass beads and the binder layer surface on both the inner and outer surfaces of such sealing layer, heating the resultant laminate, and laminating a preformed uniform thickness spacer film to the sealer, glass bead and binder layer under controlled heat conditions to bond the spacer film thereto, the spacer film substantially maintaining its uniform thickness as it is heated and laminated to the sealer-glass bead binder layer, the sealer layer aiding the bonding of the spacer film to the bead-binder surfaces, the spacer film having a metal reflective layer on its outer surface in the completed retroreflective laminate.

4,104,103
METHOD FOR MAKING CORK WALL COVERING

John A. Tarullo, Box 32159, Louisville, Ky. 40232

Continuation-in-part of Ser. No. 507,725, Sep. 30, 1974. This application Mar. 4, 1977, Ser. No. 774,259
Int. Cl.[2] C09J *5/00*
U.S. Cl. 156—309 **14 Claims**



1. A process of making a cork wall covering comprising the steps of:

(a) placing a sheet of backing material onto one side of a sheet of cork with a thermoplastic adhesive being disposed therebetween;

(b) adhering said backing material to said sheet of cork to form a two-ply sheet by subjecting said material to preselected temperature and pressure for a preselected period of time;

(c) flexing said sheet of cork and backing material by stress relieving sequentially each side of said two-ply sheet;

(d) coating the opposite side of said cork sheet with a mixture of a polyester resin adhesive and a curing agent for said polyester resin;

(e) placing a sheet of facing material onto said side of cork sheet including said polyester resin adhesive;

(f) adhering said facing material to said cork to form a three-ply sheet by subjecting said material to preselected temperature and pressure for a preselected period of time; and,

(g) cooling said three-ply sheet to a preselected temperature.

4,104,104

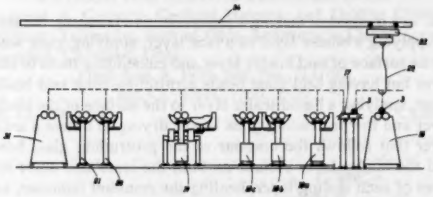
APPARATUS FOR AUTOMATICALLY PROCESSING PHOTOGRAVURE CURVILINEAR SURFACES

James Kagey Anderson, 1110 Rostrevor Cir., Louisville, Ky. 40205

Division of Ser. No. 392,475, Aug. 29, 1973, abandoned. This application May 15, 1975, Ser. No. 577,898

Int. Cl.[2] C23F *1/02*

U.S. Cl. 156—345 **3 Claims**



1. An apparatus for processing of photogravure curvilinear surfaces comprising: (a) at least three etching stations located in side by side sequential relationship to each other in a co-extensive series, each including opposed vertically extending support members and an etching tray positioned therebetween, said support members terminating in gravure cylinder receiving means for supporting said curvilinear surfaces in a preselected relationship with said tray and rotating said surfaces at a preselected speed, and, an etching system including for each station, an etching solution, an etching solution transfer means and an etching solution storage means in communication therewith, said transfer means functioning to transfer etching solution from said storage means to said etching tray and back for reuse, the concentration of the etching solution of each station being more dilute than in the preceding of each of said sequential stations in said series; (b) at least one cleaning station located in sequential, co-extensive relationship to the last of the etching stations in said series, and including opposed vertically extending support members and cleaning solution receiving means supported therebetween, said support members terminating in gravure cylinder receiving means for supporting and rotating said curvilinear surfaces at a preselected speed, said cleaning station further including a cleaning system having a cleaning solution, cleaning solution transfer means, a cleaning solution storage means in communication therewith, and delivery means for applying said cleaning solution to said cylinder; (c) conveying means supported in juxtaposition above said etching and cleaning stations for sequentially conveying said curvilinear surfaces to and from said etching stations in said series and said cleaning station; and (d) control circuit means for controlling said conveying means and rotating means of said stations so that all of said cylinder receiving means at said stations function collectively, in combination with said conveying means and said dilute etching solutions to provide that said curvilinear surfaces are treated at each of said stations for a preselected time, which time of treatment is generally the same thereby providing that movement of said curvilinear surfaces from one station to the next will be accomplished at a uniform rate.

4,104,105

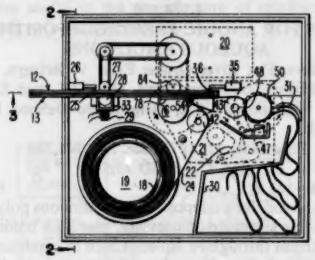
AUTOMATIC OVERLAY ATTACHING APPARATUS

Wilson Parker Rayfield, Pittsford, and Robert H. Jurgensen, Rochester, both of N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 28, 1976, Ser. No. 736,674

Int. Cl.[2] B44C *3/00*; B32B *35/00*

U.S. Cl. 156—364 **7 Claims**



1. An apparatus for applying an overlay patch to a flexible item or document such as a check or deposit slip to enable correction of an encoded number and suitable for use with items of various sizes and thicknesses, comprising:

a housing,

a document receiving and entry throat mounted on said housing the said throat having parallel channel guide members oriented vertically relative to a horizontal advancing path of movement of the document and for holding the document vertical during the overlay attaching and ejecting operation and having detection means for sensing the entry and presence of a document at an overlay application position in said throat, said throat further having a ball and skewed roller advancing means providing point contact with the document for driving the document into said advancing means, and

having means for releasing the point contact to permit the document to be ejected from the throat, and

means responsive to said detection means to cause a tape bearing an overlay patch which is to be applied to said document to advance within said housing and in said throat, and

means within said housing for attaching said overlay to said document after it has been received in said throat and while simultaneously ejecting said document from said throat, and

said ball and skewed roller advancing means comprises a roller skewed at an angle to the vertical so as to drive the document downwardly and horizontally along the horizontal path of movement of the document and located on one side of the document path, and a ball located on the opposite side of the document path and normally biased by gravity to roll toward and against said skewed roller or document positioned between said skewed roller and ball,

said ball being metallic and housed in a nonmetallic casing having a floor sloping toward the throat such that

said ball is responsive to energization of an electromagnet provided adjacent said casing for attracting the ball away from the roller or document while said document is being ejected from said throat.

4,104,106

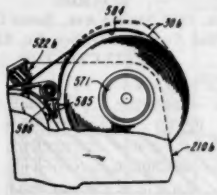
LABEL PRINTING AND APPLYING APPARATUS

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 449,111, Mar. 7, 1974, abandoned, which is a division of Ser. No. 312,454, Dec. 6, 1972, Pat. No. 3,968,745, which is a continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. This application Jan. 15, 1976, Ser. No. 649,603

Int. Cl.[2] B32B *35/00*; B41K *1/00*

U.S. Cl. 156—384 **32 Claims**



1. Apparatus for printing and applying pressure sensitive labels utilizing a supply roll comprising a composite web having pressure sensitive labels releasably secured to a web of supporting material, the apparatus comprising: printing means for printing on successive labels, a delaminator for delaminating successive printed labels from the supporting material web, an applicator for applying successive printed labels, means engageable with the supporting material web downstream of the delaminator for feeding the composite web to present partially delaminated labels to the applicator, means for operating the printing means and the feeding means in sequence, and means effective upon completion of the sequence for applying braking force to the composite web upstream of the delaminator to prevent the web from advancing toward the delaminator during application of a printed label by the applicator, wherein the means for applying braking force includes a rotatably mounted brake roll and means providing a back-up surface between which the composite web is disposed, the printing means comprising a print head for moving the brake roll into braking coaction with the composite web.

4,104,107

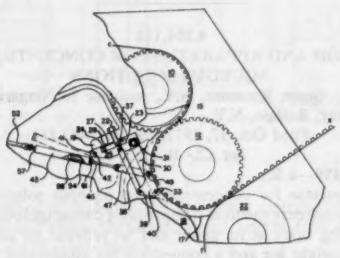
APPARATUS FOR URGING WEB GUIDES TOWARD THE CORRUGATING ROLL OF A SINGLE FACER

Kenneth Kaae Christensen, Winfield, Ill., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Mar. 18, 1977, Ser. No. 778,881

Int. Cl.[2] B31F *1/00*

U.S. Cl. 156—473 **3 Claims**



1. Apparatus for resiliently urging the web guide means of a single facer station of a machine for making corrugated board toward the corrugating rolls so as to maintain the contact of the web of corrugated medium with the corrugating rolls, comprising:

(a) plate means;

(b) means for fixably supporting said plates on said machine;

(c) a planar linkage connecting said guide means and said plates comprising

(i) a pair of spaced bars,

(ii) first pivot means connecting said bars and said plates, and

(iii) second pivot means connecting said web guide and said bars whereby oscillation of said guide means is constrained within a predetermined plane,

(d) pneumatic ram means;

(e) a hanger connecting said ram and said plate; and

(f) a pivot connecting said ram and one of said bars whereby said ram resiliently urges said guide means toward said roll to maintain the contact of said web with said corrugated roll.

4,104,108

PLASTIC BAG FORMING AND SEALING APPARATUS

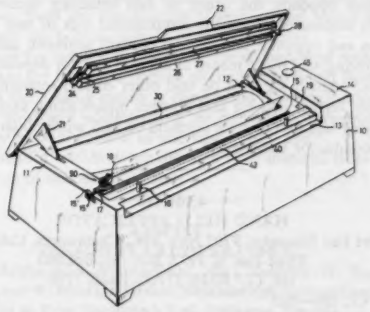
Shizuaki Kishida, and Misao Takahashi, both of Atsugi, Japan, assignors to Sanyei Corporation, Tokyo, Japan

Filed Nov. 8, 1976, Ser. No. 739,987

Claims priority, application Japan, Dec. 6, 1975, 50-145226

Int. Cl.[2] B32B *31/00*; B30B *15/34*

U.S. Cl. 156—510 **16 Claims**



1. Apparatus for forming and sealing plastic bags or the like, comprising:

a casing having a surface;

heating means at said surface and extending across said casing for heating a bag to seal it, when the bag is at said casing surface and said heating means is activated to heat;

means for activating said heating means;

a bag material cutter spaced away from said heating means and operable to cut a bag from a length of plastic held in the cutting pathway of said cutter;

a cover over said casing surface and connected with said casing; bag material support means being disposed to be beneath and supported on said cover and engageable with bag material to hold same against said casing surface as said heating means is activated and to hold same in the cutting pathway of said cutter; said cover being raisable off and to raise said support means off said casing surface;

said cutter being movable across said casing; said cutter including a blade to cut the bag material as said cutter is moved;

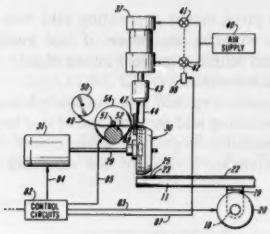
cutter guide and support means in said cover and shaped and positioned to be engaged by and to guide said cutter in motion thereof across said casing.

4,104,109

APPARATUS FOR BONDING ELECTRICAL CONTACTS TO PRINTED WIRING CIRCUIT BOARDS

Thomas George Grau, Westerville, and David Elliott Tompsett, Lancaster, both of Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 29, 1977, Ser. No. 828,513
Int. Cl.[2] B32B *31/00*; B65C *11/04*
U.S. Cl. 156—521 **17 Claims**



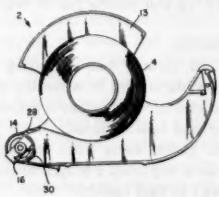
1. Apparatus for applying electrical contact segments to conductor terminations of a printed wiring circuit board comprising a table for supporting said circuit board, centrally pivotable and radially moveable plunger means arranged at right angles to the plane of said wiring board, contact segment retaining means mounted at opposite ends of said plunger means, one of said retaining means presenting a first contact segment opposite a first of said conductor terminations of said wiring board, loading means for feeding a second contact segment opposite the other of said retaining means, blade means suspended along the longitudinal axis of said plunger means and opposite said second contact segment, and means for driving said blade means along said axis for depositing said second contact segment on said other of said retaining means and for further driving said plunger means along said axis for applying said first contact segment on said wiring board at said first conductor termination.

4,104,110

HAND HELD APPLICATOR

Robert Lee Macosko, 9701 Nita Ave., Chatsworth, Calif. 91311

Filed Jun. 6, 1977, Ser. No. 804,063
Int. Cl.[2] B32B *31/00*; B44C *7/06*
U.S. Cl. 156—523 **2 Claims**



1. A tape applicator for directly dispensing pressure sensitive adhesive tape from a roll onto a surface to receive the tape comprising:

a housing;

tape roll support means on said housing for supporting a roll of tape in a tape storage compartment;

tape roller means for pressing tape to be dispensed against a surface to receive the tape;

means for maintaining tape to be dispensed in contact with said tape roller means, said means comprising;

a tape clamp operated by means of a slide button against the forces of a tape clamp return spring and a slide arm return spring;

a tooth on said tape clamp to engage a star gear mounted to the roller;

a cam for forcing said tooth to engage said star gear;

a rocker snap spring to maintain the engagement of said tooth with said star gear until after the start of dispensing said pressure sensitive adhesive tape;

tape guide means for positioning tape to be applied;

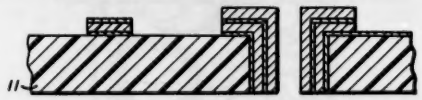
tape cut-off means operable to cut the tape when a desired length of tape has been dispensed.

4,104,111

PROCESS FOR MANUFACTURING PRINTED CIRCUIT BOARDS

Robert L. Mack, 1881 Martin Ave., Santa Clara, Calif. 95050

Filed Aug. 3, 1977, Ser. No. 821,604
Int. Cl.[2] C23F *1/02*
U.S. Cl. 156—656 **10 Claims**



1. A process for the manufacturing of printed circuit boards, comprising:

a. pre-drilling a dielectric substrate to the desired hole pattern;

b. chemically depositing a first conductive material in a layer onto the surface of the substrate including the walls of the holes;

c. coating the substrate with a first layer of plating resist in a negative image of the desired circuit pattern;

d. plating a second conductive material onto said first conductive material, in those areas not covered by said first layer of plating resist, in the desired thickness;

e. plating a durable, chemically passive third conductive material over said second conductive material;

f. coating said first layer of plating resist and conductive material with a second layer of plating resist registered with the desired circuitry and in a negative pattern of the desired terminal pad and connector areas whereby said areas are left uncoated;

g. cleaning and reactivating the uncoated areas of conductive material left uncoated following application of the second layer of plating resist coating;

h. plating a eutectic alloy in the desired thickness to said uncoated areas of the conductive material;

i. chemically stripping the first and second layers of plating resist from the substrate;

j. immersing the substrate into a chemical etching bath, said bath being adapted to chemically etch away said first conductive material but to leave said third conductive material intact.

4,104,112

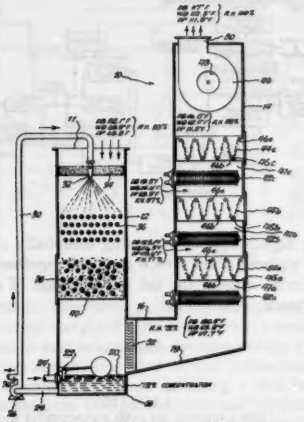
METHOD AND APPARATUS FOR CONCENTRATING AQUEOUS SOLUTIONS

Robert C. Stutz, Kenmore, N.Y., assignor to Niagara Blower Company, Buffalo, N.Y.

Filed Oct. 17, 1973, Ser. No. 407,231
Int. Cl.[2] B01D *1/16*
U.S. Cl. 159—4 R **7 Claims**

1. Apparatus for concentrating an aqueous solution of an organic antifreeze medium comprising a casing including a first upright leg open at its upper end to provide an air inlet, a second upright leg and a connecting leg connecting said first and second upright legs at their lower ends, said first upright leg containing means for evaporating said aqueous solution into a stream of ambient air, a sump positioned at the lower end of said casing for said aqueous solution and spray means posi-

tioned at said air inlet for discharging the aqueous solution against said evaporating means, pump means and conduit for drawing said aqueous solution from said sump and directing it to said spray means; said second leg containing a plurality of alternately-disposed cooling coils and reclaiming filters forming a multistage reflux chamber, the stages of said multistage chamber being disposed one below the other and interdependent, each stage being in direct counterflow communication with an adjacent stage with respect to condensed liquid, each

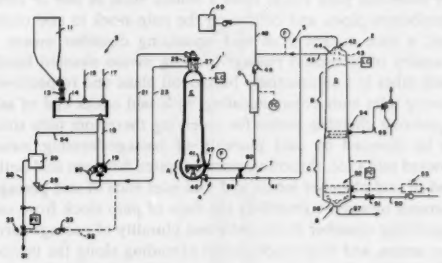


reclaiming filter except the uppermost being positioned to receive gravitating droplets directly from a subsequent superjacent reclaiming filter whereby condensed droplets of said antifreeze medium gravitate from one stage to the preceding stage relative to the direction of air flow to thereby clean the reclaiming filter of said preceding stage and to dilute the solution condensed thereon and thence gravitate to the sump, and fan means for drawing the ambient air through said air inlet, said evaporating means thence through the connecting leg and multistage reflux chamber.

4,104,113
TWO-STAGE DIGESTION WITH BETWEEN VESSEL HEATING

Michael I. Sherman, and James R. Prough, both of Glens Falls, N.Y., assignors to Kamyr, Inc., Glens Falls, N.Y.

Filed Jun. 21, 1976, Ser. No. 698,125
Int. Cl.[2] D21C 7/10
U.S. Cl. 162—19 **18 Claims**



1. A method of digesting cellulosic fiber material utilizing a first vessel and a separate second vessel, said method comprising the steps of continuously

(a) feeding cellulosic fiber material entrained in treatment liquid into a top portion of the first vessel,

(b) establishing a first flow path of cellulosic fiber material entrained in and impregnated with treatment liquid from a bottom portion of the first vessel to a top portion of the second vessel, liquid substantially filling the second vessel,

(c) establishing a column of fiber material in the second vessel below the level of liquid in the second vessel,

(d) withdrawing liquid from a top portion of the second vessel,

(e) establishing a second flow path of the liquid withdrawn from the second vessel back toward a bottom portion of the first vessel,

(f) heating the liquid during transport in said second flow path,

(g) feeding a portion of the heated liquid flowing in said second flow path into said first flow path, while feeding the rest of the heated liquid to a bottom portion of the first vessel, and

(h) withdrawing digested fiber material from the bottom of the second vessel.

8. Apparatus for the digestion of cellulosic fiber material comprising

(a) a first vertical treatment vessel having top and bottom portions,

(b) a second vertical treatment vessel separate from said first vessel and having top and bottom portions, and being substantially liquid filled,

(c) means for feeding cellulosic fiber material entrained in treatment liquid to the top portion of said first vessel,

(d) means for establishing a first flow path of cellulosic fiber material entrained in and impregnated with treatment liquid from the bottom portion of said first vessel to the top portion of said second vessel, a column of fiber material being established in said second vessel below the level of liquid in said second vessel,

(e) means for establishing a second flow path of liquid withdrawn from the top portion of said second vessel back toward the bottom portion of the first vessel,

(f) means for heating the liquid in the second flow path,

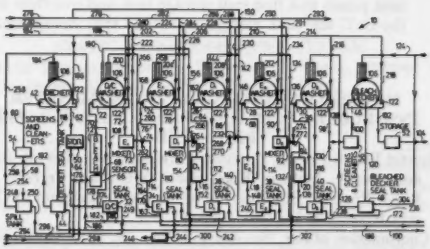
(g) means for feeding a portion of the heated liquid flowing from the heating means in the second flow path into the first flow path while feeding the rest of the heated liquid to the bottom portion of said first vessel, and

(h) means for withdrawing digested fiber material from the bottom of said second vessel.

4,104,114
BLEACH PLANT OPERATION

Gordon Rowlandson, Birmingham, Ala.; Douglas W. Reeve, Orton, and W. Howard Rapson, Scarborough, both of Canada, assignors to Erco Envirotech Ltd., Islington, Canada

Filed May 5, 1977, Ser. No. 794,240
Int. Cl.[2] D21C 3/18
U.S. Cl. 162—29 **16 Claims**



1. A bleach plant process including a combination of steps to achieve a low volume of effluent, a low consumption of water, energy and chemicals and efficient bleaching, caustic extraction and washing of cellulosic fibrous material pulp in a D/CEDED sequence, the steps comprising:

(a) passing unbleached pulp sequentially to a D/C bleaching

tower for initial bleaching with an aqueous solution of chlorine dioxide and chlorine mixed therewith, to a D/C washer for washing the initially-bleached pulp, to an E_1 caustic extraction tower for initial extraction with an aqueous sodium hydroxide solution mixed therewith, to an E_1 washer for washing the initially-extracted pulp, to a D_1 bleaching tower for further bleaching with an aqueous chlorine dioxide solution mixed therewith, to a D_1 washer for washing the further-bleached pulp, to an E_2 extraction tower for further extraction with aqueous sodium hydroxide solution mixed therewith, to an E_2 washer for washing the further-extracted pulp, to a D_2 bleaching tower for final bleaching with an aqueous chlorine dioxide solution mixed therewith, to a D_2 washer for washing the finally-bleached pulp, to a bleached pulp decer for final washing of the bleached pulp and to bleached pulp storage;

(b) controlling the quantity of chlorine fed to the initial bleaching operation to minimize overchlorination and strength losses and to result in a substantial absence of residual chlorine in the initially-bleached pulp;

(c) passing filtrate from each of said washers and said bleached decker to a seal tank associated with the respective washer or decker;

(d) removing two effluents from the process consisting of an acid effluent from the D/C seal tank and an alkaline effluent from the E_1 seal tank;

(e) providing a countercurrent flow of wash water with respect to the flow of pulp through the bleach plant consisting of passing respectively fresh water to the bleached pulp decker, passing filtrate from the bleached decer seal tank to the D_2 washer, passing filtrate from the D_2 seal tank to the E_2 washer, passing filtrate from the E_2 seal tank to the D_1 wahser, passing filtrate from the D_1 seal tank to the E_1 washer and to an initial portion of the washing on the D/C washer, and passing liquor from the E_1 seal tank to a latter portion of the washing on the D/C washer while avoiding the presence of E_1 seal tank filtrate in the D/C filtrate;

(f) conducting said washing on said E_1 washer at a dilution factor of a least about 3 while conducting said washing on said D/C washer, D_1 washer, E_2 washer, D_2 washer and bleached decker washer at a dilution factor of at least about 2;

(g) individually controlling the liquid level in each of said seal tanks below a minimum level except under emergecy conditions by cycling filtrate at a controlled rate from the respective seal tank to the appropriate washer; and

(h) connecting the seal tanks in countercurrent overflow arrangement for the accommodation of emergency conditions in which overflow from the bleached decker seal tank passes to the D_2 seal tank, overflow from the D_2 seal tank passes to the E_2 seal tank, overflow from the E_2 seal tank passes to the D_1 seal tank, overflow from the D_1 seal tank passes to the E_1 seal tank, overflow from the E_1 seal tank passes to a first spill storage tank and overflow from the D/C seal tank passes to a second spill storage tank.

4,104,115

METHOD OF MAKING PAPER FROM WATER INSOLUBLE ALGINATE FIBERS AND THE PAPER PRODUCED

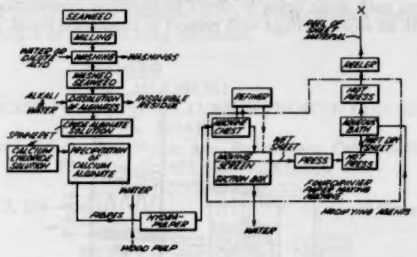
Ronald Ernest Prouse, Upminster; Anthony Alfred West, Basildon; Derek Anthony King, South Woodham Ferrers, and Roger Poulson, Billericay, all of England, assignors to Carreras Rothmans, Limited, England

Continuation of Ser. No. 420,052, Nov. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 231,837, Mar. 2, 1972, abandoned. This application Mar. 8, 1977, Ser. No. 775,621

Int. Cl.[2] D21H *5/12*

U.S. Cl. 162—100 **18 Claims**

1. A method of manufacturing alginate paper without the use or formation of an additional adhesive binder comprising the steps of forming a papermaking stock of raw fibrous water insoluble alginate material, said fibrous water insoluble alginate material being free of surface sodium alginate and being the only fibrous material used in said method, presenting said stock to the screen of the web-forming unit of a paper making machine arranged to form said paper and forming said paper on said machine, the pH value of said stock presented to said screen being at or below pH 7.0.



16. An alginate paper consisting essentially of raw water insoluble alginate fibres which are held together to form the sheet material without the use or formation of an additional adhesive binder.

4,104,116

HEADBOX FLOW CONTROLS

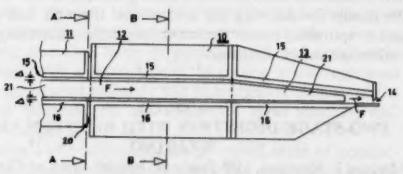
Jouni Koskimies, Jyvaskyla, Finland, assignor to Valmet Oy, Helsinki, Finland

Filed Aug. 19, 1977, Ser. No. 826,271

Claims priority, application Finland, Aug. 20, 1976, 762393

Int. Cl.[2] D21E *1/02*

U.S. Cl. 162—343 **16 Claims**

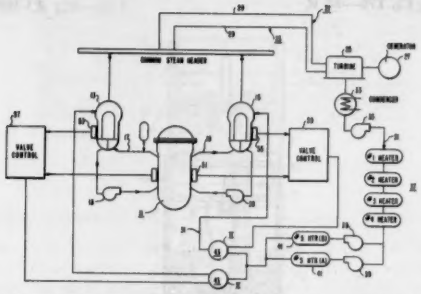


1. In a headbox system of a paper-manufacturing machine, equalizing chamber means having an outlet end and an interior for receiving pulp stock, from a source such as one or more distribution pipes, and delivering the pulp stock to said outlet end, a slice distant from said equalizing chamber means, a plurality of elongated passage-forming means situated beside each other in a substantially horizontal plane and respectively having inlet ends communicating with said outlet end of said equalizing chamber means for receiving therefrom pulp stock to be directed by said plurality of passage-forming means toward said slice, throttling means situated between said outlet end of said chamber means and said inlet ends of said passage-forming means for throttling the flow of pulp stock from said equalizing chamber means into said plurality of passage-forming means, and flow-guide means extending along the interior of said equalizing chamber means, through said throttling means, and along at least some of said passage-forming means for guiding the pulp stock flowing from said equalizing chamber means into and along said plurality of passage-forming means and for preventing creation of flow-rate variations from changes in the direction of flow of pulp stock from said equalizing chamber means into said plurality of passage-forming means.

4,104,117
NUCLEAR REACTOR POWER GENERATION

Ernest A. Parziale, Richland, Wash., and Dennis C. Richardson, Murrysville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 7, 1977, Ser. No. 766,477
Int. Cl.[2] G21C 7/00
U.S. Cl. 176—20 R 9 Claims

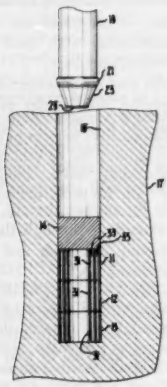


1. Apparatus for generating power including a nuclear reactor, a turbine to be energized from said reactor, a steam generator, connected to said reactor, for deriving energy therefrom, fluid-circulating means connected to said turbine and generator, said fluid-circulating means including a first branch for circulating steam from said generator to said turbine to energize said turbine and a second branch for circulating feedwater from said turbine to said generator, said feedwater to be converted into steam by said generator by the energy supplied by said reactor to said generator, valve means in said second branch for controlling the flow of said feedwater to said generator particularly at low load levels and means responsive to the magnitude of the power supplied by said reactor and the level of the water in said generator at low loads for controlling said valve means.

4,104,118
SHOCK ABSORBER

Joseph J. Housman, Del Mar, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Nov. 26, 1975, Ser. No. 635,749
Int. Cl.[2] G21C 9/00
U.S. Cl. 176—38 6 Claims

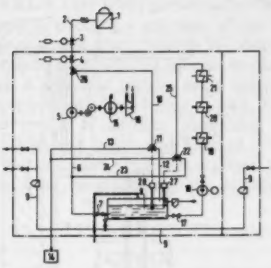


1. In combination with a nuclear reactor core structure having a blind control rod passage, a shock absorber comprising a plurality of rigid fracturable elements having a lateral size sufficient to occupy a substantial portion of the cross-sectional area of said control rod passage and having a longitudinal size sufficient to extend axially in said passage, said element being positioned in said passage adjacent the blind end thereof, said element being composed solely of a porous brittle carbonaceous material, a porous brittle ceramic material, or a porous brittle refractory oxide, said elements having a plurality of parallel holes extending longitudinally therethrough and parallel with the longitudinal axis of the passage, said holes providing a void volume of between 30% and 70% of the total volume of the elements corresponding to a predetermined level of energy absorption by said elements upon being fractured due to impact loading by a control rod.

4,104,119
EMERGENCY FEED SYSTEM FOR COOLING NUCLEAR REACTOR INSTALLATIONS

Rainer Schilling, Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Feb. 14, 1977, Ser. No. 768,500
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1976, 2606469
Int. Cl.[2] G21C 9/00
U.S. Cl. 176—38 4 Claims



1. Emergency feed system for cooling nuclear reactor installations having a vessel for containing deionate which is fed to a steam generator through an emergency feed pump having a suction line connected to the vessel comprising a circulating line extending at one end thereof from the vessel and having connected therein a circulating pump and heat exchanger means for cooling components of the emergency feed system, valve means connected to the other end of said circulating line, and a pair of lines both extending from said valve means and connected, respectively, to the suction line of the emergency feed pump and to a drainage system.

4,104,120
STATIC FUEL HOLDDOWN SYSTEM

Francis Thomas Grubelich, Wethersfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 21, 1977, Ser. No. 760,881
Int. Cl.[2] G21C 3/30
U.S. Cl. 176—50 6 Claims

1. In a nuclear reactor comprising at least one fuel assembly having fuel members and structural members for spacing and support of the fuel members, the fuel assembly being disposed longitudinally in a path of intended coolant flow, the intended coolant flow defining upstream and downstream directions, a means for preventing downstream motion of the fuel assembly, comprising:

a. a lower end fitting constituting the upstream end of the fuel assembly and connected to the rest of the fuel assembly so as to prevent relative downstream motion of the fuel assembly with respect to the lower end fitting;

b. a force-transmitting member, comprising:

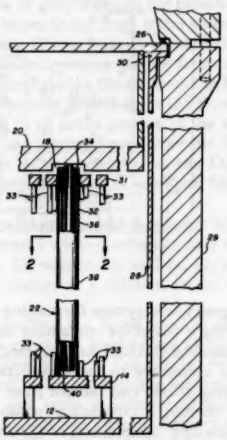
(i) an inner column having an engagement end, the inner

column extending longitudinally in one of the upstream and downstream directions from the engagement end of the inner column;

(ii) an intermediate column concentric with the inner column and hollow along at least a part of its length, which part encloses at least part of the inner column;

(iii) means for preventing movement of a point on the inner column with respect to a first point on the intermediate column when a compressive force is applied to the force-transmitting member, the remainder of the inner column being free to move with respect to the remainder of the intermediate column, simultaneous expansion of the intermediate column and compression of the inner column thereby being permitted;

(iv) an outer column concentric with the intermediate column and hollow along at least a part of its length, which part encloses at least part of the intermediate column, the outer column having an engagement end from which the outer column extends in a direction opposite to that in which the inner column extends; and



(v) means for preventing movement of a point on the outer column with respect to a second point on the intermediate column, which second point is located on the intermediate column further in the direction in which the outer column extends than is the first point, when a compressive force is applied to the force-transmitting member, the remainder of the outer column being free to move with respect to the remainder of the intermediate column, simultaneous expansion of the intermediate column and compression of the outer column thereby being permitted; for transmitting to the lower end fitting a force applied to one of the engagement ends; and

c. means for applying sufficient upstream force to the other engagement end to hold the fuel assembly in place against downstream force from the coolant, the upstream force thereby being applied through the outer, intermediate, and inner columns to the lower end fitting;

wherein the upstream and downstream movement of the force-transmitting member is restricted only by the lower end fitting and the upstream-force means.

4,104,121

SOLID ABSORBENT SAFETY DEVICE FOR A NUCLEAR REACTOR

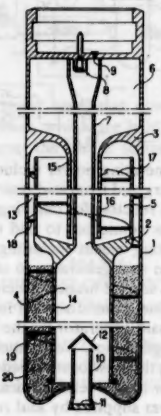
Claude Malaval, Antony, France, assignor to Groupement Atomique Alsacienne Atlantique, Le Plessis Robinson, France

Continuation-in-part of Ser. No. 365,946, Jun. 1, 1973, abandoned. This application Feb. 19, 1976, Ser. No. 659,194

Claims priority, application France, Jun. 2, 1972, 72.19990

Int. Cl.[2] G21C 7/22

U.S. Cl. 176—86 R **3 Claims**



1. In combination, a nuclear reactor and a safety device, said nuclear reactor including:

a reactor core having vertical cylindrical openings therein for receiving cylindrical fuel assemblies,

said safety device comprising:

a closed cylindrical elongated container having its lower end mounted within one of said core openings,

said container comprising upper and lower, vertically spaced transverse partition means defining an upper compartment, an intermediate compartment and a lower compartment, with said lower compartment positioned within said core,

pulverulent solid absorbent within said container,

means for applying fluid under pressure to said lower compartment and to effect by pressurized fluid passage from said lower compartment through said intermediate compartment to said upper compartment passage fluidized transport of said absorbent into said intermediate compartment for storage therein, and

an axial tube extending through the bottom of the container and having the inner end disposed within said lower comparment, and

a closing member comprising a destructible seal whose physical destruction is responsive to neutronic flux increase under reactor malfunction sealably closing the end of said tube external of said cylindrical elongated container;

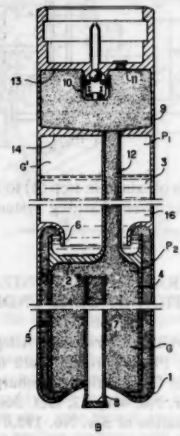
whereby, the discharge of said fluid under pressure through said tube causes fluidized transport of said pulverulent absorbent from said intermediate compartment into said lower compartment to shut down said reactor.

4,104,122

LIQUID ABSORBENT SAFETY DEVICE FOR A NUCLEAR REACTOR

Claude Malaval, Antony, and Jean-Loup Picou, L'Hay Les Roses, both of France, assignors to Groupement Atomique Alsacienne Atlantique, Le Plessis Robinson, France

Continuation of Ser. No. 366,921, Jun. 3, 1973, abandoned. This application Dec. 1, 1975, Ser. No. 636,463
Claims priority, application France, Jun. 2, 1972, 72.19989
Int. Cl.[2] G21C 7/22
U.S. Cl. 176—86 L 6 Claims



1. A safety shut down assembly for a nuclear reactor including a reactor core, said safety shut down assembly comprising:
a vertical, closed, cylindrical casing for partial vertical placement within the reactor core,
a first horizontal, transverse partition dividing said casing into vertically upper and lower compartments,
means communicating said compartments,
said upper compartment being located in said reactor above the core,
a liquid absorbent within said casing in an amount initially nearly filling said lower compartment,
said lower compartment being situated in the core of said reactor,
means for gas pressurization of the lower compartment for forcing liquid absorbent through said communicating means and into said upper compartment,
an axial vertical pipe extending through said cylindrical casing within said lower compartment and having an end external of said cylindrical casing closed off by a closing member defining a physically destructible seal whose destruction is directly responsive to a predetermined neutronic flow corresponding to a reactor malfunction;
whereby, destruction of said closure seal opens said lower compartment directly to the reactor core to cause liquid absorbent stored within the upper compartment to move into the lower compartment for shut down of said reactor.

4,104,123

PROCESS OF PRODUCING A "XANTHEMONAS-TYPE" POLYSACCHARIDE

Nguyên-Công Duc, Oulchy-le-Chateau; Jean-Louis Marie Brehant, Amiens; Benoit-Joseph Pons, Languevoisin Nesle, and Maurice Henri Séchet, Nesle, all of France, assignors to Les Produits Organiques du Santerre Orsan, Paris, France

Filed Oct. 13, 1976, Ser. No. 732,139
Claims priority, application France, Oct. 23, 1975, 75 32498
Int. Cl.[2] C12D 13/04; C12K 1/00
U.S. Cl. 195—31 P 20 Claims

1. A method of producing a Xanthane type of polysaccharide through fermentation under aerobiosis and under stirred conditions with a pH value ranging from about 5.5 to 9 and at a temperature of 25° to 35° C of an aqueous fermentation medium containing sources of carbon and of nitrogen by inoculating said aqueous fermentation medium with a strain of Xanthomonas having an increased polysaccharide production output of at least 20 percent in terms of viscosity when compared to that achieved by *Xanthomonas campestris* NRRL-B-1459 grown under the same conditions on a growth medium containing as nitrogen source any one of the amino-acids selected from the group consisting of glutamic acid, glutamine, arginine, tyrosine, threonine, aspartic acid, asparagine, proline, leucine and tryptophane, by using as said aqueous fermentation medium an aqueous medium with a content of at least 5 g/l to 55 g/l of carbohydrates and containing at least one amino-acid selected from said group as well as any other amino-acids yielding a polysaccharide producing capacity at least equal under the same conditions and with the same total nitrogen content to 50% of that yielded by corn steep liquor, the source of nitrogen of said fermentation medium corresponding to a nitrogen value ranging from 0.1 g/l to 5 g/l, and by recovering said polysaccharide from the fermented aqueous medium.

17. A method of isolating a novel strain of microorganism belonging to the Xanthomonas kind having an increased polysaccharide production output of at least 20 percent in terms of viscosity when compared to that achieved by *Xanthomonas campestris* NRRL-B-1459 when grown under the same conditions, consisting in effecting a selection of said strain from a swab taken from a sick plant through successive cultures in successive fractions of an isolating aqueous medium containing trace elements, a source of carbon, and a source of nitrogen with successive periods of incubation in each fraction of said medium, said source of nitrogen comprising a substantial amount of at least one amino-acid selected from the group consisting of glutamic acid, glutamine, arginine, tyrosine, threonine, aspartic acid, asparagine, proline, leucine and tryptophane.

4,104,124

PROCESS FOR THE PRODUCTION OF SINGLE CELL PROTEIN AND AMINO ACIDS

Vadake R. Srinivasan, Baton Rouge, La., and Ye-Chin Choi, Athens, Ga., assignors to Louisiana State University Foundation, Baton Rouge, La.

Filed Aug. 30, 1976, Ser. No. 718,974
Int. Cl.[2] C12B 1/00; C12D 13/06
U.S. Cl. 195—33 14 Claims

1. A process for the production of comestible, digestible protein which comprises cultivating a cellulase-elaborating bacterium of a mutant of Cellulomonas (ATCC-21399) which has the ability to excrete L-glutamic acid or L-lysine, or both, when the mutant microorganism is grown in a fermentation medium in the substantial absence of yeast extract on an assimilable source of carbon, and supplied with nitrogen and mineral nutrients, in the presence of oxygen at temperatures ranging from about 20° to about 40° C.

4,104,125

PROCESS FOR PRODUCING HUMAN LYSOZYME

Kazuo Takechi, Sakai; Tsuyoshi Takahashi, Osaka; Toyoaki Inaba, Nagaokakyo, and Eiichi Hasegawa, Kyoto, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Jul. 13, 1977, Ser. No. 815,359
Claims priority, application Japan, Feb. 28, 1977, 52/20984
Int. Cl.[2] C07G 7/026
U.S. Cl. 195—66 R 16 Claims

1. A process for producing a human lysozyme preparation which comprises fractionating a human blood by solubility difference to isolate an albumin fraction, contacting said albumin fraction with a weakly acidic cation-exchanger to adsorb the lysozyme contained in said albumin fraction and desorbing the adsorbed lysozyme.

4,104,126

NON-ISOTOPIC SUBSTRATE ASSAY EMPLOYING BACTERIOLYSIS PRODUCTS

David M. Young, Sherborn, Mass., assignor to Nichols Institute of Endocrinology, Inc., San Pedro, Calif.

Continuation of Ser. No. 653,455, Jan. 29, 1976, abandoned. This application Nov. 19, 1976, Ser. No. 743,413
Int. Cl.[2] G01N 31/14
U.S. Cl. 195—103.5 A 16 Claims

1. In a non-isotopic assay for a substrate for specific binding protein involving:

(a) bacteriophage-substrate conjugate, which substrate is specifically bound by said protein; and

(b) said protein in an amount insufficient to bind all of said conjugate;

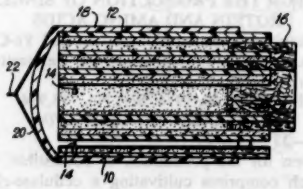
wherein free substrate and said conjugate compete for binding sites on the protein, protein-bound conjugate is inactivated, bacteriophage remaining viable are incubated with their host bacteria to occasion lysis and the level of said substrate in the specimen under assay is determined as an inverse function of a value corresponding to the extent of cell lysis, the improvement wherein an intracellular constituent freed by lysis is assayed, yielding a value proportional to the amount of said constituent, and the latter value is compared to one or more like values similarly obtained upon bacteriophage assay of standards containing known quantities of said substrate.

4,104,127

ARTICLE FOR GROWING CULTURES IN A BODY CAVITY IN THE PRESENCE OF GAS, AND PACKAGE FOR THE ARTICLE

Louis Bucalo, 155 Roberts St., Holbrook, N.Y. 11741

Division of Ser. No. 478,706, Jun. 12, 1974, Pat. No. 3,979,263. This application Jun. 18, 1976, Ser. No. 698,470
Int. Cl.[2] C12K 1/04, 1/10
U.S. Cl. 195—127 38 Claims



1. An article for growing a culture in a body cavity, comprising enclosure means, a nutrient for growing a microorganism in a given gaseous atmosphere in said enclosure means, support means for supporting said nutrient in said atmosphere and gaseous atmosphere generating means cooperating with the support means for providing a gaseous atmosphere to which the nutrient and microorganism will be exposed when the article is in said body cavity.

4,104,128

APPARATUS AND METHOD FOR RECOVERY OF COAL FINES

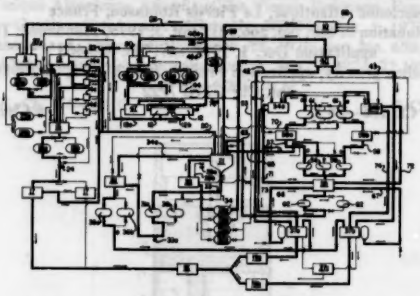
Paul V. Faber, Morristown; Edwin R. Daly, Morris Plains, and Prithvi Jain, Parsippany, all of N.J., assignors to Wilputte Corporation, New Providence, N.J.

Filed Jul. 21, 1976, Ser. No. 707,699
Int. Cl.[2] B03B 9/00; C10B 53/04
U.S. Cl. 201—4 32 Claims

27. A method for recovering coal particles and fines collected in a charge bin vent condenser of a coke oven charging system having a coal preheating stage, which method comprises the steps of:

(a) passing a liquid through the charge bin vent condenser to discharge the coal particles and fines therewith,

(b) clarifying the liquor discharged from the charge bin vent condenser in step (a) to separate liquid from solids, and



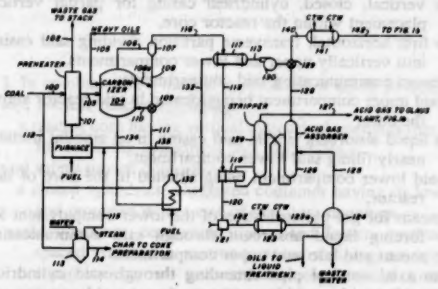
(c) returning solids obtained in step (b) to the coal preheating stage of the coke oven charging system.

4,104,129

LOW TEMPERATURE CARBONIZATION AND DESULFURIZATION OF COAL UNDER ELEVATED PRESSURES

Marvin C. Fields, Wilkins Township, Allegheny County, and Richard F. Wyse, Plum Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 410,072, Oct. 26, 1973, abandoned, which is a continuation of Ser. No. 195,075, Nov. 2, 1971, abandoned. This application Aug. 30, 1974, Ser. No. 501,898
Int. Cl.[2] C10B 55/10, 57/00
U.S. Cl. 201—17 6 Claims



1. A method of coal conversion and subsequent product recovery comprising:

(i) a first step of conducting a coal carbonization and desulphurization by contacting a mixture of finely divided particles of char and coal with a gas having at least about 20 mol percent hydrogen and at a temperature of between about 950° to about 1500° F and a pressure of 30–300 psi, said gas containing no more than about 2% by volume of hydrogen sulphide and being substantially free of oxygen, said process yielding a char containing no more than about 1% by weight of sulphur, said char being suitable for the production of a metallurgical grade coking material, and

(ii) a second step of recovering individual components including a pure carbon dioxide from the gaseous products of said carbonization and desulphurization step by the use of the gas pressures from said carbonization and desulphurization step which carbon dioxide is recovered by reacting a gas stream containing hydrogen, methane and carbon monoxide with steam and removing carbon dioxide from the reaction products, and wherein this second

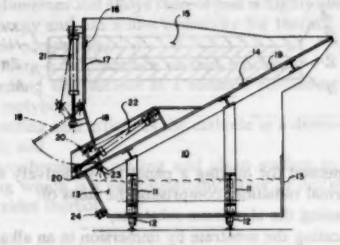
step includes low temperature condensation of individual components from said gaseous products.

4,104,130

COKE QUENCHING CAR

Albert Calderon, 1065 Melrose Dr., Bowling Green, Ohio 43402

Filed Jul. 9, 1976, Ser. No. 703,857
Int. Cl.² C10B 39/14
U.S. Cl. 202—230 **6 Claims**



1. Apparatus comprising a movable carriage for supporting a body of coke as the body of coke is quenched with liquid to reduce the temperature of the body of coke, said carriage comprising a substantially unbroken surface portion which is inclined with respect to a horizontal plane so that liquid disposed thereon may advance toward the bottom thereof under the influence of gravity, gate means associated with said substantially unbroken surface portion, said gate means including at least one gate member which is selectively movable to a first position to limit the range of movement of a body of coke disposed on said substantially unbroken surface portion under the influence of gravity and which is selectively movable to a second position to permit discharge of the body of coke from said substantially unbroken surface portion, means defining a liquid reservoir supported by said carriage and disposed below said substantially unbroken surface portion, said reservoir including an upwardly extending wall portion having an upper end spaced from the lower end of said substantially unbroken surface portion, a bottom wall means disposed in the space between the upper end of said upwardly extending wall portion and the lower end of said substantially unbroken surface portion for guiding coke under the influence of gravity across said space when said gate member is in said second position, said bottom wall means including a fluid passage between the bottom of said substantially unbroken surface portion and said reservoir when said gate member is in said first position, said gate member being positioned relative to said substantially unbroken surface when said gate member is in said first position so as to allow liquid to flow therebetween, thus establishing and maintaining fluid communication between said substantially unbroken surface portion, said fluid passage, and said reservoir to allow quenching liquid to drain from the body of coke into said reservoir.

4,104,131

PROCESS FOR SEPARATING AMMONIA AND ACID GASES FROM WASTE WATERS CONTAINING FIXED AMMONIA SALTS

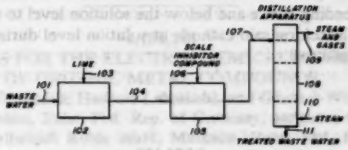
William J. Didycz, Whitehall Borough; Donald Glassman, Mount Lebanon Borough; Edward E. Maier, Plum Borough, and George T. Saniga, Penn Hills Township, Alleghany County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Jul. 8, 1976, Ser. No. 703,407
Int. Cl.² B01D 3/38
U.S. Cl. 203—7 **38 Claims**

1. A process for separating acid gases and ammonia from a dilute aqueous solution thereof, said solution being derived from a coal conversion process and also containing free and fixed ammonia salts and sulfate ion in a concentration of less than about 1500 ppm, said process comprising:

(a) subjecting said solution to a first countercurrent multi-stage continuous distillation, said distillation being conducted by having a gradient of ammonia concentration decreasing towards the region of bottom liquid withdrawal which results in said bottom liquid having a pH of more than 9,

(i) withdrawing an overhead vapor stream containing a major proportion of stripping vapor, some of said acid gases from said solution, and some of the ammonia from said free ammonia salts,

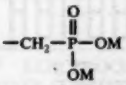


(ii) withdrawing an aqueous bottom stream which contains a major proportion of water, acid gases, free ammonia salts and substantially all of said fixed ammonia salts;

(b) adding lime to said withdrawn bottom stream, said lime being added in an amount sufficient to form an insoluble precipitate and evolve ammonia contained in the fixed ammonia salts during a second distillation of said mixture;

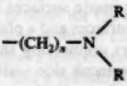
(c) adding a threshold amount of at least one scale inhibitor compound of the general formula

where R is



R′ is selected from the group consisting of R and $—CH_2C-H_2OH$, and

R″ is selected from the group consisting of R, $—CH_2C-H_2OH$, and



where each M is independently selected from the group consisting of H, NH_4, and alkali metal, "*n*" is a whole number from 1 to 3, to said dilute aqueous solutions to thereby inhibit the deposition of scale on the trays of the distillation towers; and

(d) subjecting said withdrawn bottom stream to a second countercurrent multi-stage continuous distillation,

(i) withdrawing an overhead vapor stream, said vapor stream containing a major proportion of stripping vapor and a portion of the ammonia from the fixed ammonia salts and reusing this overhead vapor stream as a stripping vapor in the first distillation, and

(ii) withdrawing an aqueous bottom stream, said stream having a substantially reduced concentration of acid gases and ammonia as compared to said aqueous solution.

4,104,132

METHOD FOR ELIMINATING SOLUTION-LEVEL ATTACK ON CATHODES DURING ELECTROLYSIS

Ernest R. Cole, Jr., Newburg, Mo., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jul. 22, 1977, Ser. No. 818,183
Int. Cl.[2] C25C 1/16, 7/00
U.S. Cl. 204—12 6 Claims

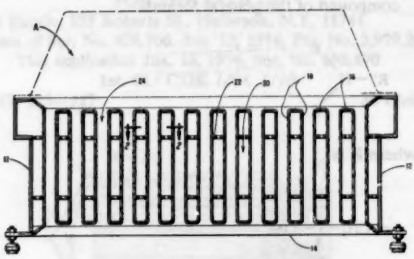
1. In a process for electrolytically depositing zinc from a solution of an electrolyte in a cell by passing a current from the anode to the cathode and depositing the zinc on the cathode, the improvement consisting of positioning a barrier structure between, but not in contact with, said anode and said cathode and extending above and below the solution level to eliminate oxygen attack on said cathode at solution level during operation of said cell.

4,104,133

METHOD OF IN SITU PLATING OF AN ACTIVE COATING ON CATHODES OF ALKALI HALIDE ELECTROLYSIS CELLS

James R. Brannan, Painesville; Irving Malkin, University Heights, and Clayde M. Brown, Perry, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Jul. 27, 1977, Ser. No. 819,458
Int. Cl.[2] C25D 5/02, 5/48, 7/04
U.S. Cl. 204—25 6 Claims



1. A method of in situ electrodeposition of a nickel-zinc alloy coating onto surfaces of cathode tubes disposed within a cathode can of an electrolysis cell for the production of ahlogens and alkali metal hydroxides, said cathode tubes each having a pair of vertically oriented parallel foraminous planar side walls each having outside surfaces and facing inside surfaces and a catholyte space intermediate said inside surfaces and a plurality of horizontally disposed spacer members connecting said inside surfaces of each of said pair of foraminous side walls and having vertically aligned openings therethrough, the method which comprises:

cleaning and rinsing said cathode can;

immersing said cathode can in a plating solution containing nickel ions and zinc ions;

immersing plating anodes within said cathode can and parallel to said cathode tubes;

electrically connecting said plating anodes and said cathode tubes to a source of direct current so that said plating anodes are anodic and said cathode tubes are cathodic;

electrodepositing a nickel-zinc alloy coating on said inside and outside surfaces of said cathode tubes;

removing said anodes and said plating solution from said electrolysis cell, and

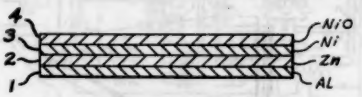
leaching said coating to remove at least some zinc therefrom whereby said cell may be placed in use for the production of halogens and alkali metal hydroxides.

4,104,134

METHOD FOR MAKING AN ALUMINUM OR COPPER SUBSTRATE PANEL FOR SELECTIVE ABSORPTION OF SOLAR ENERGY

Marion L. Roberts; Max H. Sharpe, and Albert C. Krupnick, all of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 31, 1977, Ser. No. 829,390
Int. Cl.[2] C25D 5/50, 5/34, 5/44
U.S. Cl. 204—37 R 10 Claims



1. A method for making a panel for selectively absorbing solar thermal radiation, comprising the steps of:

(a) cleaning the aluminum substrate;

(b) zincating the substrate by immersion in an alkaline solution of zinc ions;

(c) electroplating on the thus-zincated substrate a layer of nickel from a basic nickel sulfamate bath;

(d) oxidizing the thus-produced nickel layer in an oxygen-containing gas at 800°–1050° F. for 2–7 minutes.

7. A method for making a panel for selectively absorbing solar thermal radiation, comprising the steps of:

(a) cleaning the copper substrate,

(b) electroplating on the copper substrate a layer of nickel from a basic nickel sulfamate bath;

(c) oxidizing the thus-produced nickel layer in an oxygen-containing gas at 800°–1050° F. for 2–7 minutes.

4,104,135

METHOD OF PRODUCING HIGHLY CORROSION RESISTANT TIN-PLATED STEEL SHEET

Taketoshi Fujimaki; Shoji Shijima, and Shunichi Harada, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Continuation of Ser. No. 454,150, Mar. 25, 1974, abandoned.
This application Aug. 4, 1975, Ser. No. 601,516
Claims priority, application Japan, Apr. 3, 1973, 48-37395
Int. Cl.[2] C25D 5/10, 5/50
U.S. Cl. 204—37 T 5 Claims

1. A method for producing a highly acid corrosion resistant tin-plated steel sheet having a reduced ATC value when compared to conventional tin-plate comprising:

electroplating a coating selected from the group consisting of nickel, copper and nickel-tin alloy upon a steel sheet said coating having a thickness immediately after coating of between 0.005μ and 0.5μ;

heating the plated steel sheet in a non-oxidizing atmosphere to completely diffuse the coating, enable the coating to penetrate the surface and to allow for reformation of the steel sheet surface so that the plating metal layer has substantially disappeared from said surface; and

electroplating a tin coating on the reformed steel sheet surface to produce a tin-plated steel sheet.

4,104,136

PROCESS FOR APPLYING THIN MOLYBDENUM CONTAINING COATINGS ON ALUMINUM FOR SOLAR ENERGY ABSORPTION

Daniel Joseph Schardein, and Ruth Diane Lloyd, both of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Division of Ser. No. 615,245, Sep. 22, 1974, abandoned. This application Jun. 3, 1977, Ser. No. 803,320
Int. Cl.[2] C25D 5/44, 9/12
U.S. Cl. 204—38 B 7 Claims

1. The process of producing a thin, adherent coating on an article of aluminum and alloys thereof that is highly absorptive to solar energy and has a low emissivity for thermal energy, said process comprising:

A. providing a clean surface on said article;

B. immersing said surface in a solution containing ammonium molybdate;

C. connecting said article as the cathode in a direct-current circuit; and

D. electrochemically plating said clean surface to form a coating which is a nearmonatomic layer of molybdenum and oxides thereof.

4,104,137

ALLOY PLATING

Ronald J. Lash, Warren, and Otto Kardos, Ferndale, both of Mich., assignors to M&T Chemicals Inc., Stamford, Conn.

Filed Jun. 10, 1977, Ser. No. 805,410
Int. Cl.[2] C25D 3/56
U.S. Cl. 204—43 T 18 Claims

1. A process for the preparation of an electrodeposit which contains iron and at least one metal selected from the group consisting of nickel and cobalt which comprises passing current from an anode to a cathode through an aqueous acidic plating solution containing an iron compound and at least one member selected from the group consisting of cobalt compounds and nickel compounds providing cobalt or nickel ions for electrodepositing alloys of iron with cobalt and/or nickel and containing 1 to 50 g/l of at least one substituted or unsubstituted dihydroxybenzene complexing agent.

4,104,138

BRASS PLATING

Frank Passal, Royal Oak; Ronald J. Lash, Warren, and Otto Kardos, Ferndale, all of Mich., assignors to M&T Chemicals Inc., Stamford, Conn.

Filed Jun. 7, 1977, Ser. No. 804,468
Int. Cl.[2] C25D 3/58
U.S. Cl. 204—44 11 Claims

11. A composition for electroplating bright brass having an alloy composition of from 45% to 65% copper comprising an aqueous alkaline cyanide electroplating solution containing:

at least one copper compound providing 11 to 26 g/l of copper ions,

at least one zinc compound providing 11 to 26 g/l of zinc ions,

0.1 to 10 g/l of a salt of at least one condensed arylsulfonic acid, and

0.1 to 2 g/l of at least one aldehyde or the bisulfite adduct of at least one aldehyde.

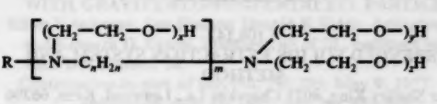
4,104,139

ELECTROPLATING ZINC

Francesco Cargnino, Venaria (Turin), and Giorgio Audisio, Turin, Italy, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 4, 1977, Ser. No. 810,732
Int. Cl.[2] C25D 3/22
U.S. Cl. 204—55 R 5 Claims

1. Zinc-containing aqueous electroplating bath containing alkali metal hydroxide and, as complexing agent, a reaction product of phosphoric acid or polyphosphoric acid with a compound of the formula



(I),

in which

R represents methyl, ethyl, hydroxyethyl or hydrogen,

n is 2, 3 or 4,

m is in the range of from 1 to 5,

x and y are 1 or 2, and

z is 0 or 1.

4,104,140

PROCESS FOR THE ELECTROCHEMICAL SYNTHESIS OF ORGANIC METAL COMPOUNDS

Wilhelm Eisenbach; Herbert Lehmkuhl, and Günther Wilke, all of Mulheim, Ruhr, Fed. Rep. of Germany, assignors to Studiengesellschaft Kohle mbH, Mulheim, Ruhr, Fed. Rep. of Germany

Division of Ser. No. 403,239, Oct. 3, 1973, Pat. No. 3,964,983. This application May 26, 1976, Ser. No. 690,339
Claims priority, application Austria, Oct. 5, 1972, 8547/72
The portion of the term of this patent subsequent to Jun. 22, 1993, has been disclaimed.
Int. Cl.[2] C25B 3/02
U.S. Cl. 204—78 15 Claims

10. Process for the reaction of an H-acidic organic compound in which the acidic H-atom is bonded by oxygen or sulphur to the organic radical and which has a pK value of up to about 20, with a metal having a standard potential which is more positive than −1.66 volts and which does not or only incompletely reacts with the H-acidic compound under current-free conditions, wherein the H-acidic compound or its solution in polar solvent is made conducting by addition of a soluble salt containing ions of at least one of chloride, bromide and iodide and is electrolysed at temperatures up to 150° C, using said metal as the anode, wherein the H-acidic compound is ethylacetoacetate.

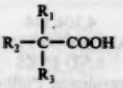
4,104,141

ELECTROCHEMICAL OXIDATION OF ALKOXY-SUBSTITUTED AROMATIC COMPOUNDS

Michael Martan, Rehovot, Israel, and Mark A. Halter, Arlington Heights, Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 752,653, Dec. 20, 1976, abandoned. This application Aug. 3, 1977, Ser. No. 821,454
Int. Cl.[2] C25B 3/02
U.S. Cl. 204—78 10 Claims

1. A process for the electrochemical oxidation of an alkoxy-substituted aromatic compound which comprises treating said compound a temperature in the range of from about 0° to about 100° C. and a pressure in the range of from about atmospheric to about 100 atmospheres with an acid having the formula:



in which at least 2 R's are alkyl groups containing from 1 to about 10 carbon atoms and the remaining R is hydrogen or an alkyl group containing from 1 to about 10 carbon atoms and an alkali or alkaline earth metal salt of such an acid and a phase transfer agent comprising a symmetrical or asymmetrical tetraalkylnitrogen or phosphorus-based salt containing from 1 to about 20 carbon atoms in the alkyl chain, in an electrochemical cell maintained at a voltage in the range of from about 2 to about 20 volts and a current density in the range of from about

20 to about 200 milliamperes/cm^2, and recovering the resultant acetoxylated alkoxy-substituted aromatic compound.

4,104,142

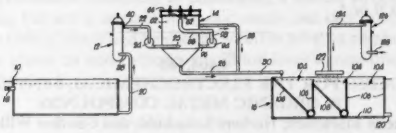
SUSPENDED SOLIDS EXTRACTION SYSTEM AND METHOD

Arthur Shelley King, 8021 Cherokee La., Leawood, Kans. 66206

Division of Ser. No. 713,251, Aug. 10, 1976. This application Apr. 27, 1977, Ser. No. 791,337

Int. Cl.^{2} C02B *1/82;* C02C *5/12;* B03C *5/00*

U.S. Cl. 204—152 **5 Claims**



1. In a method of treating a liquid suspension to remove suspended solids, the steps of:

subjecting the suspension to an electrostatic field to initiate coagulation and flocculation;

allowing the suspension to thereafter rest to settle out the flocculated solids; and

between said subjecting and settling steps, exposing the suspension sequentially to groups of concentrated lines of force in an electrolytic treater whereby to intensify the coagulation and flocculation initiated by said electrostatic field.

4,104,143

INKS AND COATING COMPOSITIONS CONTAINING ROSIN-MODIFIED EPOXY RESINS

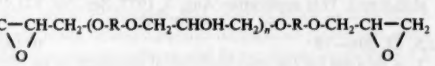
Olgierd Wasilewski, Edison; Ronald Saltzman, Morris Plains, and William J. Ferrara, Hackensack, all of N.J., assignors to Sun Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 628,835, Nov. 14, 1975. This application Mar. 30, 1977, Ser. No. 782,928

Int. Cl.^{2} C08L *93/04;* C08F *2/46*

U.S. Cl. 204—159.15 **7 Claims**

1. A solvent-free photopolymerizable printing ink comprising an ethylenically unsaturated monomeric ester; a photoinitiator; a colorant; and about 5 to 25 percent, based on the weight of the total composition, of a hydrogenated wood rosin-modified epoxy resin, said epoxy resin having the formula



wherein R is the divalent hydrocarbon radical of a dihydric phenol and *n* is an integer of 1 to about 10, and the equivalent ratio of rosin acid to epoxy resin being about 0.85-1:1.

4,104,144

RADIATION-CURABLE COATING COMPOSITIONS AND INKS

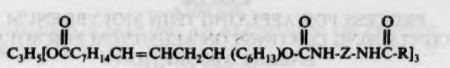
Marvin Weiss, New Providence; Phillip Adams, Murray Hill; Gerald I. Nass, Secaucus, and Roland L. Leitner, Somerset, all of N.J., assignors to Kewanee Industries, Bryn Mawr, Pa.

Division of Ser. No. 585,615, Jun. 10, 1975, Pat. No. 4,026,939. This application Dec. 9, 1976, Ser. No. 749,168

Int. Cl.^{2} C08F *2/46, 4/00*

U.S. Cl. 204—159.23 **5 Claims**

1. A radiation curable composition containing, as a vehicle, a polymerizable agent selected from the group consisting of a monomer, and mixtures of such monomers, wherein said monomer has the formula:



wherein Z is a divalent aromatic, aliphatic or cycloaliphatic radical and R is an alkoxy group substituted by a plurality of α,β -unsaturated low molecular weight acylate groups.

4,104,145

METHOD FOR PRODUCING NITROBENZENE

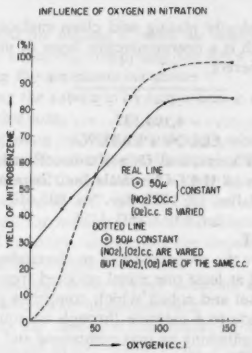
Wataru Ando, Sakura, and Ichiro Nakaoka, Machida, both of Japan, assignors to Kabushiki Kaisha Pollution Preventing Research Laboratory, Tokyo, Japan

Filed Mar. 28, 1977, Ser. No. 782,165

Claims priority, application Japan, Mar. 27, 1976, 51-33082

Int. Cl.^{2} B01J *1/10*

U.S. Cl. 204—162 R **6 Claims**



1. In the method for reacting benzene with nitrogendioxide to produce nitrobenzene under irradiation of visible ray or ultraviolet ray in the presence of oxygen characterized in that excess nitrogendioxide and excess oxygen are added to benzene, respectively.

4,104,146

PROCESS FOR THE PURIFICATION OF GAS STREAMS

Jerome R. Sudduth, Pasadena, and Donald A. Keyworth, Houston, both of Tex., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Jul. 2, 1975, Ser. No. 592,563

Int. Cl.^{2} B01K *1/00;* B01D *53/34*

U.S. Cl. 204—165 **4 Claims**

1. The process for the removal of vinyl chloride from a gas stream that contains from about 10 ppm to 1000 ppm of vinyl chloride and substantially no oxygen that comprises passing said gas stream through a silent electric discharge zone at such a rate that at least 80% of the vinyl chloride in the gas stream is destroyed.

4,104,147

PROCESS FOR CATIONIC ELECTRODEPOSITION OF AMINE ACID SALT-CONTAINING POLYMERS

Joseph R. Marchetti, Greensburg; Robert R. Zwack, New Kensington, and Robert D. Jerabek, Glenshaw, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 648,982, Jan. 14, 1976, which is a continuation-in-part of Ser. No. 547,323, Feb. 5, 1975, Pat. No. 3,947,339, which is a continuation-in-part of Ser. No. 203,875, Dec. 1, 1971, abandoned. This application Apr. 19, 1977, Ser. No. 788,706

Int. Cl.^{2} C25D *13/06*

U.S. Cl. 204—181 C **15 Claims**

1. An improved method for coating a conductive substrate

serving as a cathode, which method comprises passing electric current between an anode and said cathode in electrical contact with the water dispersion of a resinous composition, the improvement wherein the resinous composition comprises the reaction product of:

(A) a polyepoxide having a molecular weight of at least 350,

(B) a secondary amine,

(C) a polyester polyol containing at least two alcoholic, primary hydroxyl groups, said polyester polyol being selected from the class consisting of polylactones and polyesters prepared by polyesterification of organic polycarboxylic acids or anhydrides thereof with organic polyols; said reaction product being dispersible in water with the aid of an acid to provide cationic groups in the resin.

4,104,148

ELECTROPLATING TANK HAVING ELECTRIC RINSE WATER HEATING SYSTEM

Don W. Stech, Broadview Hts., Ohio, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed May 21, 1976, Ser. No. 688,710

Int. Cl.[2] C25B *9/00*; H05B *3/00*; F24H *1/16*

U.S. Cl. 204—242 **2 Claims**

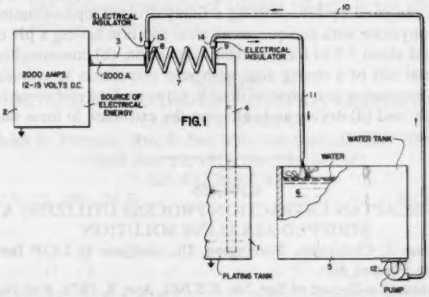


FIG. 1

1. The combination of a plating tank system for plating items, said plating tank system having a plating tank, a 12–15 volt, 2000 amp. DC source of electrical energy and an electrical bus bar having two spaced apart segments conducting electrical energy from the source of electrical energy to the plating tank; and

a water tank system comprising a water tank having water therein to be heated for washing items plated in the plating tank system, a water coil of electrically conductive material electrically bridging the gap between the segments of the electrical bus bar of the plating tank system and electrically connecting said bus bar segments in series current flow relationship in a manner whereby current can flow from the source of electrical energy, through one bus bar segment, the water coil and the other bus bar segment to the plating tank to heat the coil, said water coil being capable of carrying a current of 2000 amps at 12–15 volts DC and having spaced opposite ends, duct means connecting one end of the water coil to the water tank, additional duct means connecting the other end of the water coil to the water tank, pump means in the duct means for circulating water from the water tank through the duct means, water coil and additional duct means whereby said water is heated by electrical energy from the source of electrical energy, and a current return path from the plating tank back to said source of electrical energy.

4,104,149

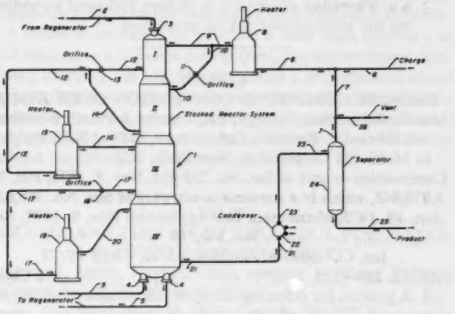
MULTIPLE-STAGE HYDROCARBON CONVERSION WITH GRAVITY-FLOWING CATALYST PARTICLES

Elliot Veinerman, Des Plaines; Donald E. Felch, Arlington Hts., and Kenneth D. Peters, Elmhurst, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 795,250, May 9, 1977. This application Aug. 29, 1977, Ser. No. 828,803

Int. Cl.[2] C10G *35/12*

U.S. Cl. 208—64 **13 Claims**



1. In a multiple-stage catalytic conversion system wherein, (1) heated hydrocarbonaceous charge stock and hydrogen flow serially through a plurality of catalytic reaction zones; (2) reaction product effluent is subjected to inter-stage heating between successive reaction zones; and, (3) catalyst particles are movable through each reaction zone via gravity-flow, the method of effecting the conversion of said charge stock which comprises the sequential steps of:

(a) heating said charge stock and hydrogen, and introducing a first portion thereof into a first reaction zone maintained at hydrocarbon conversion conditions;

(b) restricting the flow of a second portion of the heated charge stock and hydrogen, and introducing said second portion into a second reaction zone maintained at hydrocarbon conversion conditions;

(c) restricting the flow of the effluent from said first reaction zone and combining therewith the effluent from said second reaction zone;

(d) heating the resulting mixture and introducing the same into a third reaction zone maintained at hydrocarbon conversion conditions;

(e) separting the effluent from the last reaction zone in said system to provide (i) a normally liquid product stream and, (ii) a hydrogen-rich vaporous phase, and recycling at least a portion of said vaporous phase to said first reaction zone;

(f) at least periodically withdrawing catalyst particles from the last reaction zone in said system; and,

(g) at least periodically introducing fresh, or regenerated catalyst particles into the first reaction zone in said system.

4,104,150

PROCESS FOR THE PRODUCTION OF COKE FROM PITCH

Ingo Romey, Drevenack; Georg Kölling, and Hellmut Kokot, both of Essen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 596,055, Jul. 7, 1975, abandoned. This application Feb. 7, 1977, Ser. No. 765,892

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1974, 2434295

Int. Cl.[2] C10G *9/14*

U.S. Cl. 208—91 **10 Claims**

1. The improvement in preparing pitch for a coking procedure to obtain acicular coke of premium quality wherein the

pitch is subjected to a preliminary filtration to remove undesirable elements, including ashes, soot and heavy metals therefrom,

the said improvement comprising

preheating crude coal tar pitch to at least 100° C above its softening point and a point below its decomposition temperature, mixing the pitch with at least 5 g of a particulate solid adsorbent filtering aid per kg of crude pitch prior to filtration and then filtering the coke at at least the said preheat temperature in the absence of a solvent or diluent through a pressure filter having a mesh size of about 3–200 μ at a pressure of about 2 to 10 bars, followed by subjecting the pitch to said coking procedure.

4,104,151

ORGANIC COMPOUND CONVERSION OVER ZSM-23

Mae K. Rubin, Bala Cynwyd, Pa.; Charles J. Plank, Woodbury, and Edward J. Rosinski, Pedricktown, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 739,414, Nov. 8, 1976, Pat. No. 4,076,842, which is a continuation-in-part of Ser. No. 585,632, Jun. 10, 1975, abandoned. This application Nov. 9, 1977, Ser. No. 849,919

Int. Cl.[2] B01J *8/24;* **C07C** *15/02;* **C01B** *29/28*

U.S. Cl. 208—111 **32 Claims**

1. A process for effecting catalytic conversion of an organic compound charge which comprises contacting said charge under catalytic conversion conditions with a catalyst comprising a synthetic crystalline aluminosilicate zeolite having a composition expressed in terms of mole ratios of oxides in the anhydrous state as follows:

$$(0.58 \text{ to } 3.4)M_{2/n}O : Al_2O_3 : (40 \text{ to } 250)SiO_2$$

wherein M is at least one cation having a valence n and having an X-ray powder diffraction pattern substantially as shown in Table I of the specification, or a thermal decomposition product thereof.

4,104,152

HYDROGENATION PROCESS WITH SULFIDED CATALYST

Lee Hilfman, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 716,904, Aug. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 597,627, Jul. 21, 1975, Pat. No. 3,981,796, which is a continuation-in-part of Ser. No. 418,700, Nov. 23, 1973, Pat. No. 3,933,683. This application Sep. 19, 1977, Ser. No. 834,621

Int. Cl.[2] C10G *13/06;* **B01J** *23/16, 27/04*

U.S. Cl. 208—112 **6 Claims**

1. A hydrogenation process utilizing a catalyst containing a Group VIB metallic component and a Group VIII metallic component present in an oxidized form which catalyst is activated according to a method which comprises the steps of:

(a) intimately contacting said mass of catalyst with gaseous hydrogen, containing a sulfur compound, at a temperature within the range of from about 550° F. to about 800° F. for a sufficient time to effect the reduction and sulfiding of a major proportion of said metallic components; and

(b) stripping the resulting reduced and sulfided catalyst with substantially pure hydrogen at a temperature within the range of from about 750° F. to about 900° F.

4,104,153

METHOD FOR REFORMING HYDROCARBONS

Henry Erickson, Park Forest, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Division of Ser. No. 205,355, Dec. 6, 1971, Pat. No. 4,066,740. This application Aug. 3, 1977, Ser. No. 821,382

Int. Cl.[2] C10G *35/08*

U.S. Cl. 208—138 **6 Claims**

1. In a method for reforming a hydrocarbon feedstock comprising paraffins and naphthenes in at least one reaction zone with a catalyst comprising platinum group metal and alumina in the presence of free molecular hydrogen at hydrocarbon conversion conditions, the improvement which comprises using alumina prepared by a method which comprises:

(1) forming a mixture of an aqueous slurry of hydrous alumina and at least one surface active agent, said hydrous alumina predominating in α-alumina monohydrate having a crystallite size of less than 100A, said surface active agent being present in the mixture in an amount sufficient to increase the porosity of the calcined alumina hereinafter described;

(2) drying said mixture to obtain a solid product which can be formed into macrosized particles;

(3) forming said solid product into macrosized particles; and

(4) calcining said macrosized particles to form calcined alumina having increased porosity.

4,104,154

REFORMING OF A NAPHTHA FRACTION IN CONTACT WITH AN ALUMINA-SUPPORTED CATALYST

Roy T. Mitsche, Wauconda, and George N. Pope, McHenry, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Apr. 18, 1977, Ser. No. 788,375

Int. Cl.[2] C10G *35/04*

U.S. Cl. 208—138 **12 Claims**

1. A process for the catalytic reforming of a naphtha fraction which comprises passing said naphtha fraction and hydrogen in contact with an alumina-supported platinum group metal catalyst at reforming conditions, said alumina support having been prepared by (a) admixing a finely divided alpha-alumina monohydrate with an aqueous alkaline solution having a pH of at least about 7.5 to form a stable suspension; (b) commingling a metal salt of a strong acid with said suspension to convert said suspension to a paste or dough; (c) extruding said paste or dough; and (d) drying and calcining the extrudate to form said alumina support.

4,104,155

MERCAPTAN EXTRACTION PROCESS UTILIZING A STRIPPED ALKALINE SOLUTION

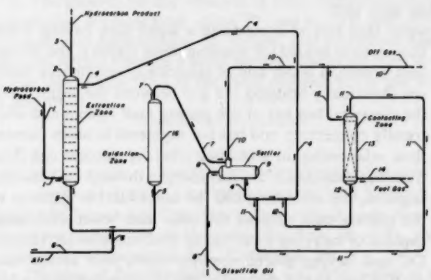
William J. Christman, Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 675,081, Apr. 8, 1976, Pat. No. 4,040,947. This application Apr. 14, 1977, Ser. No. 787,690

The portion of the term of this patent subsequent to Aug. 9, 1994, has been disclaimed.

Int. Cl.[2] C10G *19/08*

U.S. Cl. 208—235 **5 Claims**



1. A continuous process for the removal of mercaptans from a feed stream comprising at least 1000 wt. ppm. mercaptans and a mixture of hydrocarbons having boiling points below about 650° F., which comprises the steps of:

(a) contacting the feed stream with an alkaline solution comprising water and an alkaline reagent in an extraction zone maintained at extraction conditions effective to pro-

mote the transfer of essentially all of the mercaptans from the feed stream to the alkaline solution and the formation of a treated product stream, which is removed from the extraction zone, and a mercaptan-containing alkaline solution;

(b) contacting said mercaptan-containing alkaline solution with oxygen and with an oxidation catalyst in an oxidation zone at conditions effective to form an oxidation zone effluent stream comprising disulfide compounds in said alkaline solution;

(c) passing said oxidation zone effluent stream into a phase separation zone operated at conditions selected to produce a first liquid phase comprising said alkaline solution, a second liquid phase comprising said disulfide compounds and an off-gas stream comprising oxygen;

(d) withdrawing the second liquid phase from the phase separation zone of step (c);

(e) recycling a first portion of said first liquid phase from step (c) to the extraction zone of step (a);

(f) removing said off-gas stream from said process in admixture with a first vapor stream as hereinafter delineated;

(g) countercurrently stripping a second portion of said first liquid phase with a second vapor stream comprising hydrocarbons having less than 5 carbon atoms at conditions effective to strip water from the second portion of said first liquid phase and to form said first vapor stream; and,

(h) admixing the stripped second portion of said first liquid phase from step (g) with said first portion of the liquid phase of step (e) being recycled to the extraction zone to form said alkaline solution of step (a), whereby water formed in the oxidation zone is removed from the process and the concentration of alkaline reagent in the alkaline solution is controlled.

4,104,156

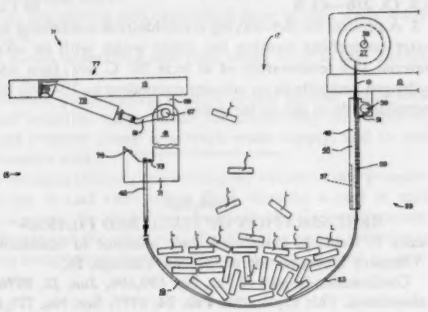
DETACHABLE SLING LETDOWN APPARATUS FOR LUMBER SORTER

John K. Fletcher, Rte. 8, Box 320, Hot Springs, Ark. 71901

Filed Jun. 13, 1977, Ser. No. 805,901

Int. Cl.² B65G *47/34*

U.S. Cl. 209—74 R **9 Claims**



1. In a lumber sorter of the type having frame means defining a plurality of bays for receiving pieces of lumber, each of said bays being provided with at least a pair of elongated flexible members establishing cooperative forward and rearward sling-like cradles which support the lumber pieces as they are systematically dropped therein, and means for selectively controlling the height of said forward and rearward cradles, the improvement which comprises at least a pair of automatically operable coupler means for selectively coupling and uncoupling one of the respective ends of said pair of elongated flexible members with said frame means for enabling dangling ends thereof to readily be established thus facilitating disengagement from the lumber pieces.

4,104,157

FLOTATION OF SULFIDE MINERALS

Gerald F. Fountain; Jaime Veloz; Edward A. Bilson, and John A. Cronin, all of Inspiration, Ariz., assignors to Inspiration Consolidated Copper Company, Morristown, N.J.

Filed May 12, 1976, Ser. No. 685,544

The portion of the term of this patent subsequent to Jun. 7, 1994, has been disclaimed.

Int. Cl.² B03D *1/02*

U.S. Cl. 209—166 **10 Claims**

1. In the process of froth flotation concentration of a sulfide mineral which minimizes the collection of slimes and in which an aqueous pulp of an ore containing such mineral is subjected to a flotation operation to produce a final high recovery of such mineral in a flotation concentrate, the improvement comprising carrying out said flotation with a polyglycerol added prior to flotation to deactivate said slimes and present in the aqueous pulp in an amount sufficient to increase recovery of such mineral in the final concentrate over that obtainable without the presence of said polyglycerol.

4,104,158

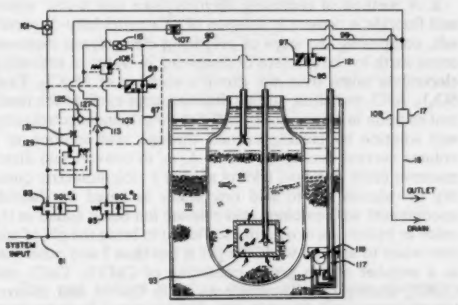
VOLUME AND TIME OF DAY CONTROL FOR WATER SOFTENER REGENERATION

Stephen H. Davis, Dayton, Ohio, assignor to Water Refining Company, Inc., Middletown, Ohio

Filed Mar. 18, 1977, Ser. No. 779,097

Int. Cl.² B01D *15/04*

U.S. Cl. 210—25 **7 Claims**



1. A control circuit for controlling initiation of the regeneration cycle of a water softener, which softener is capable of softening a predetermined quantity of water before requiring regeneration, comprising:

flow meter means for sensing the rate of water flow through said softener and providing a pulse output, the frequency of which is proportional to the flow rate,

predetermined counter means, responsive to said flow meter pulse output for providing a first enabling output when a first count is reached indicating that the capacity for treating a normal 24 hour supply of water remains, and for providing a second enabling output when a second count is reached indicating that the capacity for treating has been depleted,

timer means, having an input responsive to the first enabling output of said counter means, for connecting its input to an output once each timer cycle at a predetermined time, and

regeneration timer means, responsive to the output from said timer means and to said second enabling output from said counter means for initiating and timing softener regeneration whereby regeneration will be initiated at a predetermined time of day after the capacity of the softener is reduced to a 24 hour supply of water or when the capacity for treating water has been depleted, if such depletion of

the water should occur prior to said predetermined time of day.

4,104,159

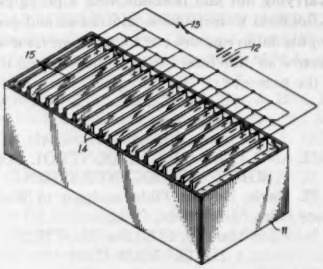
METHOD OF SEPARATION OF FLUORIDE ION FROM WATER

Masakuni Kanai, No. 1-5-601, Arai 1-chome, Nakano-ku, Tokyo-to, Japan

Continuation-in-part of Ser. No. 544,544, Jan. 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 305,758, Nov. 13, 1972, abandoned. This application Jan. 24, 1977, Ser. No. 761,557

Int. Cl.[2] C02B *1/14*

U.S. Cl. 210—28 **22 Claims**



1. A method of removing fluoride from raw water where said fluoride is present in solution or as a colloidally-dispersed salt, comprising the steps of preparing electrolyzed diatomaceous earth by the substeps of dissolving in water an activating electrolyte taken from the group consisting of $MgCl_2$, $Fe_2(SO_4)_3$, $AlCl_3$ and alum, adding diatomaceous earth to the resultant solution in an amount from 0.5 to 50 g/l, and electrolyzing said solution by passing current through said solution at a volume current density of 7 to 50 A/m^3 to convert said diatomaceous earth to a floc, adding at least a stoichiometric quantity of calcium ion to said raw water as based on fluoride uncombined with calcium, said calcium ion being added as the oxide or hydroxide in quantity sufficient to bring the pH of said raw water to about 7 when the pH is less than 7 and otherwise as a member of the group consisting of $CaCO_3$, $CaCl_2$ and $CaSO_4$; adding said diatomaceous earth floc in said electrolyzed solution to said raw water in an amount from 5 to 100 liters of electrolyzed solution per 1000 liters of raw water subsequent to said addition of calcium ion and passing electric current through said raw water at a volume current density of 5 to 20 A/m^3 until virtually all of said fluoride is converted to CaF_2 and adsorbed on said floc.

4,104,160

PROCESS FOR THE PURIFICATION OF INDUSTRIAL EFFLUENTS

Hans Wegmüller, Riehen, and Jaroslav Haase, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 690,804, May 27, 1976, Pat. No. 4,026,796, which is a division of Ser. No. 582,021, May 29, 1975, Pat. No. 3,979,285, which is a continuation of Ser. No. 356,853, May 3, 1973, abandoned. This application Feb. 25, 1977, Ser. No. 772,169

Claims priority, application Switzerland, May 10, 1972, 7012/72

Int. Cl.[2] C02B *1/60*; C02C *5/08*

U.S. Cl. 210—36 **4 Claims**

1. A process for purifying industrial effluents containing residual dyestuffs, optical brighteners, dyeing auxiliaries, detergents, tanning agents or mixtures thereof, which comprises bringing said effluents into contact with a cellulosic absorbent pretreated with a mixture of polyalkyleneimine which has a molecular weight of 20,000 to 80,000 and a salt of a polyvalent metal.

4,104,161

METHOD FOR TREATING AQUEOUS WASTES CONTAINING AT LEAST 1% PROTEINACEOUS MATTER

Gary M. Wein, Hanover Park, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Apr. 18, 1978, Ser. No. 788,200

Int. Cl.[2] C02B *1/20*

U.S. Cl. 210—54 **3 Claims**

1. A method for treating rendering plant aqueous wastes containing at least 1% by weight of proteinaceous matter which comprises:

A) adding at least 0.48% by weight based on dry proteinaceous matter of a water-soluble polyamine polymer to the aqueous wastes, said polymer being chosen from the group consisting of ethylene dichloride-ammonia, ethylene dichloride-ammonia-methyl chloride, and dimethylamine-epichlorohydrin-ammonia;

B) dispersing said polyamine within the aqueous wastes;

C) allowing the aqueous wastes to stand for a sufficient period of time to allow the flocs of proteinaceous matter to coagulate and settle thereby producing a precipitate of proteinaceous matter; and,

D) recovering the precipitate of proteinaceous matter.

4,104,162

PROCESS FOR DETOXIFICATION OF FORMALDEHYDE CONTAINING WASTE WATERS

Helmut Junkermann, and Heinrich Schwab, both of Frankfurt, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Koessler, Frankfurt, Germany

Continuation-in-part of Ser. No. 569,747, Apr. 21, 1975, abandoned. This application Aug. 4, 1975, Ser. No. 601,957

Claims priority, application France, Apr. 22, 1974, 74 13931; Sep. 26, 1974, 74 32527

Int. Cl.[2] C02B *1/34*; C02C *5/04*

U.S. Cl. 210—63 R **10 Claims**

1. A process for detoxifying formaldehyde containing waste water comprising treating the waste water with an alkaline material at a temperature of at least 50° C. and then adding hydrogen peroxide in an amount equivalent to 10–35% of the formaldehyde in the waste water.

4,104,163

REGENERATION OF FIXED BED FILTERS

James F. Grutsch, Hammond, Ind., assignor to Standard Oil Company a corporation of Indiana, Chicago, Ill.

Continuation-in-part of Ser. No. 699,696, Jun. 25, 1976, abandoned. This application Feb. 24, 1977, Ser. No. 771,432

Int. Cl.[2] B01D *23/24*

U.S. Cl. 210—80 **5 Claims**

1. A method for the regeneration of a fixed bed granular media filter used for the clarification of liquids, after said filter has become unsuitable or inefficient due to the occlusion of oily substances, said regeneration comprising:

first, backwashing the filter;

second, draining the filter;

third, contacting the filter with an aqueous alkali solution comprised of sodium hydroxide dissolved in demineralized water, said solution having a pH value of about 10.5 or greater, at a temperature ranging from about ambient to about 200° F, for a time sufficient to regenerate the filter;

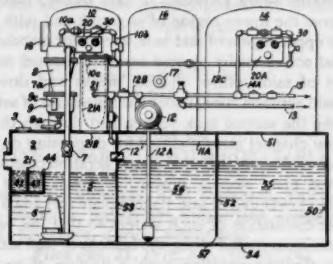
fourth, backwashing the filter.

4,104,164

DEVICE FOR TREATING WASTE WATER

Robert G. Chelton, 1337 SW. 21 Ter., Ft. Lauderdale, Fla. 33312

Filed Mar. 2, 1977, Ser. No. 773,703
Int. Cl.[2] C02B 5/00; B08B 3/10; B60S 3/04
U.S. Cl. 210—136 **7 Claims**



1. A recirculating filter system for treating wash water containing contaminated components made up of cleaning components and sediment components comprising,

a generally rectangular tank having a top,

a centrifugal filter,

a wash water filter containing gravel, sand and anthrafil,

a pressure tank,

a rinse water filter containing activated charcoal,

and a backwash reclaim unit supported on said tank top, and connected to said rinse water filter and said tank,

said tank having a partition therein dividing said tank into an unfiltered storage well and a filtered storage well,

an inlet to said unfiltered storage well adapted to be connected to a source of unfiltered water,

a sand trap in said unfiltered well disposed to receive water from said inlet,

wier means from said sand trap through which water may flow to said unfiltered well,

a submersible pump disposed in said unfiltered well,

check valve means connecting said submersible pump to said centrifugal filter,

means connecting said centrifugal filter to said wash water filter,

and means connecting said rinse water filter to said filtered water well,

a pressure pump having an inlet in said filtered water well and selective valve means for connecting the output of said pressure pump to a wash water supply, and to said pressure tank,

and means selectively connecting the output of said pressure pump to said rinse water filter whereby a part of said water can be used with dissolved cleaning components therein and the other part of said water having said cleaning components removed therefrom can be used as rinse water.

4,104,165

WATER SOFTENING SYSTEM

John W. Braswell, 712 S. West End Blvd., Cape Girardeau, Mo. 63701

Filed Jun. 24, 1976, Ser. No. 699,215
Int. Cl.[2] B01D 23/24
U.S. Cl. 210—191 **7 Claims**

1. In a water treatment system having a treatment tank and an ion-exchange mineral bed therein, and a brine tank, regeneration control apparatus comprising:

(a) a plunger valve means including an aspirator for producing a flow of fluid,

(b) a raw liquid inlet port, and a treated liquid outlet port,

(c) a first conduit means connecting the raw liquid inlet port to the top of the treatment tank in a first position of the plunger valve means,

(d) a second conduit means connecting the treated liquid outlet port to the lower interior of the treatment tank,

(e) a drain port and a drain valve means for opening or closing the drain port, the drain port being connected to the first conduit and the raw liquid inlet port through the aspirator in the plunger valve means in a second position of the plunger valve means when the drain valve means is open,

(f) a third conduit means connecting the raw liquid inlet port to the second conduit means,

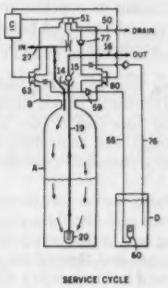
(g) a wash valve means for opening or closing the third conduit means,

(h) a brine tank inlet port and a brine tank outlet port, and separate conduit means connecting each of the last said ports separately to the brine tank to provide one conduit means for delivering brine from the brine tank and another separate conduit means for delivering treated liquid to the brine tank,

(i) a fourth conduit means connecting the brine tank inlet and outlet ports to the second conduit means,

(j) a brine valve means in the fourth conduit between the brine tank inlet and outlet ports for controlling flow therethrough,

(k) means maintaining the drain valve means, wash valve means and brine valve means closed in the service cycle for water flow from the raw liquid inlet port, through the



first and second conduit means and in one direction through the mineral bed, and through the treated liquid outlet port,

(l) the last said means maintaining the drain valve means open, and the wash valve means and brine valve means closed in the brining cycle for water flow from the raw liquid inlet port and through the aspirator in the plunger valve means to the drain port, and for concurrent brine flow from the brine tank inlet port, through the fourth, second and first conduit means and in the opposite direction through the mineral bed, and to the drain port through the aspirator in the plunger valve means,

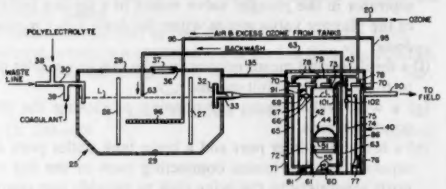
(m) the last said means maintaining the drain valve means and the wash valve means open, and the brine valve means closed in the wash cycle for water flow from the raw liquid inlet port through the aspirator in the plunger valve means to the drain port, and for concurrent water flow from the raw liquid inlet port, through the second and first conduit means and through the mineral bed in the same direction as the brine flow through the mineral bed in the brining cycle, and through the aspirator in the plunger valve means to the drain port whereby to remove the brine, and

(n) the last said means maintaining the drain valve means and the wash valve means closed, and the brine valve means open in the rinse and brine tank refill cycle for liquid flow from the raw liquid inlet port, through the first, second and fourth conduits, and to the brine tank outlet port.

4,104,166
APPARATUS FOR PURIFYING SEPTIC TANK EFFLUENT

Julius LaRaus, 150 Crandon Way, Rochester, N.Y. 14618

Filed May 17, 1976, Ser. No. 687,041
Int. Cl.[2] C02B *1/38;* B01D *21/02*
U.S. Cl. 210—195 R 7 Claims



1. Apparatus for purifying septic tank effluent, comprising

a first tank adapted to be placed in the ground adjacent a septic tank,

a plurality of ozonating tanks smaller than said first tank and mounted in said first tank in spaced relation,

a filter tank also smaller than said first tank and mounted therein in spaced relation to said ozonating tanks,

a first pipe for connecting said filter tank to an adjacent septic tank to have the liquid effluent from the septic tank pass substantially at atmospheric pressure through said filter tank from an inlet adjacent one end of said filter tank to an outlet adjacent its opposite end,

a filter mounted in said filter tank between said inlet and said outlet to filter solids from the liquid passing through said filter tank,

means connecting said ozonating tanks in series with one another and to the outlet of said filter tank to cause filtered liquid from said filter tank to pass longitudinally and successively through the ozonating tanks in said series thereof, and for a cumulative distance greater than sixteen feet, and

means for supplying ozone gas to each of said ozonating tanks for contact with the fluid passing therethrough,

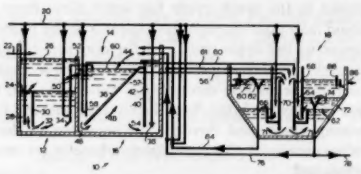
the last ozonating tank in said series thereof having an outlet adjacent its upper end thereof for discharging ozonated effluent from said last tank into a storage space formed in said first tank around the outsides of said ozonating tanks and said filter tank, and

said first tank having an outlet disposed at approximately the same level as the outlet in said last ozonating tank to allow discharge of excess effluent from said storage space.

4,104,167
APPARATUS FOR PURIFYING WASTE WATERS

Ferdinand Besik, 3243 Chokecherry Cres., Mississauga, Ontario, Canada (L5L 1B1)

Division of Ser. No. 730,815, Oct. 8, 1976. This application Feb. 7, 1977, Ser. No. 765,886
Int. Cl.[2] C02C *1/08*
U.S. Cl. 210—195 S 7 Claims

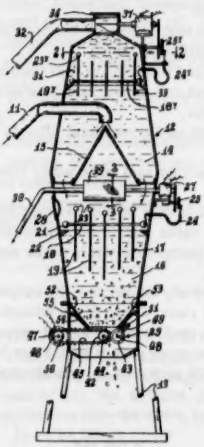


1. An apparatus for treatment of contaminated waters comprising a first tank in which an equalization zone is defined, a second tank in which aeration and sludge separation zones are defined and a third tank in which a clarifying zone is defined, means for transferring such waters from the equalization zone to the upper region of said aeration zone, a slanted plate located in said second tank with its lower end being spaced from tank bottom and side walls to define said aeration zone which overlies said sludge separation zone; the slanted plate extending across said second tank thereby separating the aeration zone from the sludge separation zone, an aeration upflow channel means being provided in said second tank with its intake across the lower region of said tank and with its outlet across the upper region of said tank, means for circulating such waters and active media up said aeration channel means, out the outlet of said upflow channel means and downwardly through said aeration zone, under the lower end of said slanted plate, along the second tank bottom and through the inlet of said upflow channel means, means for dispensing oxygen into such active media which flows up said aeration channel means, said slanted plate sloping upwardly towards said aeration channel, the lower end of said slanted plate forming a constriction to the circulation of such waters so that the velocity of such waters is increased along the bottom of said second tank below the sludge separation zone, a portion of such waters entering the sludge separation zone and flowing upwardly to develop a fluidized bed of active media, the height of said sludge separation zone being sufficient to effectively separate a major portion of active media from the processed contaminated waters in the fluidized bed, and means for transferring the processed waters from the upper region of said sludge separation zone to said clarifying zone of the third tank.

4,104,168
SLUDGE SETTLING AND DE-WATERING APPARATUS

Sandor G. Kiss, 236 E. Sunset Ave., Lombard, Ill. 60148

Filed Aug. 8, 1975, Ser. No. 603,004
Int. Cl.[2] B01D *21/24*
U.S. Cl. 210—297 8 Claims



4. A sludge consolidator comprising a vertically elongated tank, a sludge inlet located substantially midway between its ends, a disbursing element below said inlet, a water discharge line located beneath said disbursing element, a filter in the water discharge line, said filter comprising a revolvable screen and means associated with the screen to remove solid particles therefrom and discharge them outside the tank, a collection chamber for heavy solids below said filter, a vibratory means in said chamber, a valved outlet in the bottom of said chamber, said valved outlet including a pair of rollers arranged parallel one to the other, a belt trained over one roller, means to rotatably drive said rollers, means mounting one roller for movement toward and away from the other roller, spring means

normally urging said movable roller in surface to surface contact with the belt, said belt and movable roller being resilient to yield under pressure of solids passing between them, and a trapezium-shaped hopper arranged above the nip of said rollers, said tank including a compartment above the sludge inlet in which particles of less weight than the water accumulate, and discharge means in said compartment to carry the said particles away from said compartment.

4,104,169

FILTERING APPARATUS WITH ROTATABLE FILTER ELEMENTS AND SEAL

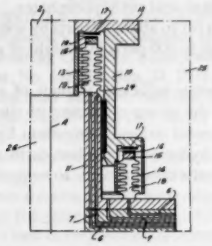
Hans Müller, Im Allmendli, 8703 Erlenbach, Switzerland, and Bruno Guazzone, Rapperswil, Switzerland, assignors to Hans Muller, Erlenbach, Zurich, Switzerland

Filed Jun. 21, 1976, Ser. No. 697,762

Claims priority, application Switzerland, Jun. 20, 1975, 8107/75

Int. Cl.² B01D *33/28*

U.S. Cl. 210—331 **6 Claims**



1. A filter comprising:
a housing defining a closed chamber;
a hollow shaft rotatable in said chamber about an axis;
a sleeve connected to said housing and centered on said axis;
a plurality of filter elements connected to and rotatable with said shaft;
means including a filtrant inlet opening into said chamber and a filtrate outlet opening into said shaft for passage of a suspension to be filtered from said inlet to said outlet through said filter elements;
a pair of axially connected sealing surfaces connected to and rotatable with said shaft and annularly surrounding said axis;
a pair of annular bellows-type seals each having a hollow interior and concentrically surrounding said shaft, said seals each having one axial end secured nonrotatably to said sleeve and an opposite axial end axially engageable with a respective one of said surfaces, and said seals each being axially extensible between a normal relaxed position with said opposite end spaced from the respective surface and an extending position with said opposite end bearing axially on the respective surface, said seals forming with said shaft and sleeve in the respective extended positions an annular compartment isolated from the interior of said shaft and from said chamber and annularly surrounding said shaft;
means for introducing a clean liquid under pressure into said annular compartment between said seals and thereby flushing particles between said opposite ends and the respective surfaces; and
means including a fluid passage opening into said hollow interior of said seals for pressurizing said interiors and thereby extending said seals into said extended positions.

4,104,170

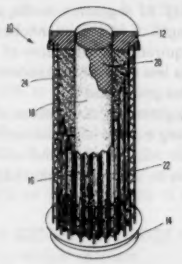
LIQUID FILTER HAVING IMPROVED EXTENDED POLYPROPYLENE ELEMENT

Donald A. Nedza, Furlong, Pa., assignor to Met-Pro Corporation, Hatfield, Pa.

Continuation-in-part of Ser. No. 608,501, Aug. 28, 1975, abandoned. This application Jan. 7, 1977, Ser. No. 757,599

Int. Cl.² B01D *39/16*

U.S. Cl. 210—487 **7 Claims**



1. A filter comprising at least one folded pleat for removing contaminants from a fluid stream comprising:
a laminated filter element including a single supporting underlayer formed of a highly dispersed continuous polypropylene filament oriented in a random pattern and repeatedly crossing itself, said filament being partially fused and thereby bonded to itself at substantially all of those points at which it crosses itself, and a filtering overlayer comprising a plurality of individual polypropylene fibers randomly arranged upon said supporting underlayer and bonded both to said underlayer and to one another, said folded pleat being substantially resistant to breakage at its fold.

5. A filter of the cylindrical cartridge type, comprising:
a pleated outer element having a plurality of folds;
an unpleated inner element disposed concentrically within said outer element;
a pair of elastomeric end caps enveloping the axial ends of said first and second element;
said outer filament comprising a laminate including a first, supporting underlayer formed of a highly dispersed continuous polypropylene filament oriented in a random pattern, and a filtering overlayer comprising a plurality of individual polypropylene fibers randomly arranged upon said underlayer and being partially fused and thereby bonded to both said underlayer and to one another, said folds being substantially resistant to breakage.

7. A filter of the cylindrical cartridge type, comprising:
a pleated outer filter element having a plurality of folds;
a pair of elastomeric end caps disposed at either end of said filter element and enveloping the ends thereof;
said filter element comprising:
a supporting underlayer of a highly dispersed continuous polypropylene filament oriented in a random pattern, said continuous filament being partially fused and thereby bonded to itself at points of intersection; and
a plurality of individual polypropylene fibers disposed upon said underlayer, said polypropylene fibers and filament material being at least partially heat-fused, whereby the polypropylene fibers are bonded to both said continuous filament and to one another, said folds being substantially resistant to breakage.

4,104,171

METHOD FOR TRANSPORTING WAXY OILS BY PIPELINE

Frank W. Stechmeyer, Newport Beach, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Dec. 30, 1976, Ser. No. 755,840
Int. Cl.[2] C09K *3/00*
U.S. Cl. 252—8.3 **11 Claims**

1. In the transportation of a wax-containing oil by pipeline, a method for reducing the force required to initiate the flow of a gelled static column of the oil in the pipeline, the method comprising:

forming a plurality of segments in the column of oil, the number and length of said segments being selected so that the pressure required to initiate flow of the oil at any point in the pipeline is less than the maximum operating pressure allowable at that point; and

separating each segment from adjacent segments by a fluid spacer comprising a material which is fluid at the temperature of the static column of oil and which has a low yield strength relative to said oil at that temperature.

4,104,172

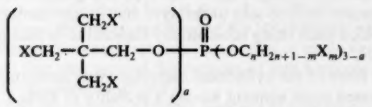
DURABLE FLAME RETARDANT FINISHES FOR TEXTILE MATERIALS

Ray E. Smith, and James A. Albright, both of Ann Arbor, Mich., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Feb. 23, 1976, Ser. No. 660,500
Int. Cl.[2] C09K *3/28*
U.S. Cl. 252—8.1 **50 Claims**

1. A flame retardant textile finish, said textile being cotton or a blend of cotton and polyester fibers, consisting essentially of:

(a) from about 15 to about 35 percent of a flame retardant compound of the formula



wherein each X is independently selected from chlorine, bromine, and hydrogen, wherein *a* is an integer from 1 to 2, wherein *n* an integer from 1 to 8, and wherein *m* is an integer from 0 to *n*, provided that when *n* is 1, *m* is 0, and mixtures thereof;

(b) from about 0.5 to about 10 percent of an emulsifying agent which is capable of passing the following three tests: (1) Solubility (Compatability) Test: said emulsifying agent (20 parts by weight) must be soluble in 80 parts by weight of said flame retardant compound at no more than 80° C.; (2) Shelf Life Test: a blend of said emulsifying agent and said flame retardant compound prepared as in the Solubility Test must remain in one clear homogeneous phase at 22° C. for at least 1 hour; (3) Finish Formulation Test: a flame retardant finish within the scope of this invention is prepared and must remain in one homogeneous phase for a minimum of 1 hour at 20° C.;

(c) from about 25 to about 45 percent of a water soluble quaternary phosphonium salt selected from the group consisting of tetrakis (hydroxymethyl) phosphonium and tetrakis(methylhydroxymethyl)phosphonium salt;

(d) from about 9 to about 16 percent of a water soluble organic nitrogen containing compound selected from the group consisting of urea, thiourea, guanidine, and dicyandiamide; and

(e) from about 20 to about 32 percent of water.

4,104,173

GELLING AGENTS FOR HYDROCARBON COMPOUNDS

Robert L. Gay, Portland, Oreg.; Richard J. Schlott, Arlington Heights, and James E. Burroughs, Mt. Prospect, both of, IL, assignors to Borg-Warner Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 306,773, Nov. 15, 1972, abandoned, which is a continuation-in-part of Ser. No. 209,401, Dec. 17, 1971, abandoned. This application Aug. 20, 1975, Ser. No. 606,264
Int. Cl.[2] C09K *3/00*
U.S. Cl. 252—8.55 R **5 Claims**

1. A method of making a gelled hydrocarbon composition comprising the steps of

(a) preparing a mixture of alkyl acid orthophosphates by reacting phosphorus pentoxide with a mixture of at least two alcohols wherein at least one alcohol is selected from the group consisting of C_1 to C_5 n-alkanols and at least one alcohol is selected from the group consisting of C_6 to C_{18} alkanols and C_6 to C_{18} alkenols,

(b) reacting said mixture of alkyl acid orthophosphates with a basic aluminum compound selected from the group consisting of hydrated alumina and aluminum alkoxides in a ratio of from 2.67 to 8 gram atoms of phosphorus per gram atom of aluminum to produce a partial aluminum salt of the alkyl acid orthophosphates,

(c) adding from 0.1 to about 10 parts by weight of said partial aluminum salt to 100 parts by weight of a liquid hydrocarbon, and

(d) adding thereto sufficient amount of a second base selected from the group consisting of alkali metal hydroxides, alkali metal oxides, ammonium hydroxide, alkaline earth metal hydroxides, alkaline earth metal oxides, and alkali metal salts of weak acids to neutralize the remaining acidity.

4,104,174

WATER SOLUBLE WATERFLOOD CORROSION INHIBITOR

Philip Merchant, Jr., Houston; F. Luther Powell, Willis, and Cosmas O. Ohaji, Houston, all of Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 611,993, Sep. 10, 1975, Pat. No. 3,989,460. This application Jun. 30, 1976, Ser. No. 701,282
The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.
Int. Cl.[2] C23F *11/10*
U.S. Cl. 252—8.55 D **5 Claims**

1. A water-soluble corrosion inhibiting composition, particularly useful in waterflooding environments in which the water is a brine, which comprises from 45 to 90 wt. % of a heterocyclic nitrogen hydrochloride selected from the group consisting of alkyl piperazine hydrochloride and alkyl pyridine hydrochloride, and from 2 to 40 wt. % of an ethoxylated tridecyl alcohol containing about 10 units of ethylene oxide.

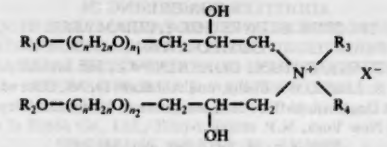
4,104,175

AQUEOUS SOLUTIONS OF QUATERNARY AMMONIUM COMPOUNDS

Eva Margareta Martinsson, Stenungsund, and Karl Martin Edvin Hellsten, Odsmal, both of Sweden, assignors to Modokemi Aktiebolag, Stenungsund, Sweden

Division of Ser. No. 423,592, Dec. 10, 1973, Pat. No. 3,972,855, which is a continuation-in-part of Ser. No. 306,251, Nov. 10, 1972, abandoned. This application Nov. 19, 1975, Ser. No. 633,317
Int. Cl.[2] C14C *9/00*; D06M *13/18*; D06M *13/46*
U.S. Cl. 252—8.57 **6 Claims**

1. A freeze-thaw stable aqueous solution comprising a quaternary ammonium compound having the general formula:



wherein:

R_1 and R_2 are aliphatic hydrocarbon groups having from about eight to about fourteen carbon atoms;

R_3 and R_4 are methyl, ethyl or hydroxyethyl;

n is a number from 2 to 4, representing the number of carbon atoms in the oxyalkylene substituent;

n_1 and n_2 are numbers within the range from 0.5 to about 10; and

X is an anion selected from the group consisting of chloride, bromide, iodide, nitrate, hydroxyl, phosphate, methyl sulfate, formate, acetate, citrate, propionate, tartrate and carbonate in a concentration from about 5 to about 10% by weight, having no or only a slight tendency to gel and freeze-separate when subjected to repeated freezing and thawing.

4,104,176

POROUS LUBRICANT-IMPREGNATED BEARING

James L. Bidler, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 615,993, Sep. 23, 1975, abandoned. This application May 13, 1977, Ser. No. 796,789

Int. Cl.[2] C10M *5/00, 7/00;* **F16D** *69/00;* **F16C** *0/00*

U.S. Cl. 252—12.2 **19 Claims**

1. A porous lubricant-impregnated bearing comprising a body shaped to support a rotating shaft and containing an interconnected pore structure filled with migratable lubricant that is drawn from the pore structure to lubricate rotation of the shaft; characterized in that said body comprises a matrix of solid discrete particles closely packed so as to define a network of interconnected interstices and bonded together with a bonding material that is different from the particles, is disposed within and chemically reacted in situ in the interstices so as to be dimensionally stable at PV's of 100,000, and only partially fills the interstices so as to leave spaces between substantially all adjacent matrix particles, whereby a uniform fine pore structure is formed from which lubricant will be uniformly drawn and maintained during rotation of said shaft.

4,104,177

GREASE COMPOSITIONS

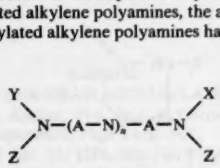
Gerard P. Caruso, New Orleans, La., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 751,413, Dec. 16, 1976, abandoned. This application Oct. 3, 1977, Ser. No. 839,071

Int. Cl.[2] C10M *1/32, 3/26, 5/20, 7/30*

U.S. Cl. 252—51.5 A **6 Claims**

1. A grease composition comprising of a major amount of a lubricating oil base vehicle, a polyurea gellant in an amount sufficient to thicken the base vehicle to a grease consistency and a minor amount of an acylated alkylene polyamine or mixture of acylated alkylene polyamines, the acylated alkylene polyamine or acylated alkylene polyamines having the formula



wherein A is alkylene of 2 to 4 carbon atoms and n is an integer of from 0 to 3, X is H or Z, Y is selected from H, alkyl containing 12 through 22 carbon atoms, and Z, and Z is an acyl group selected from alkanoyl containing 2 to 22 carbon atoms, hydroxy alkanoyl containing 2 to 22 carbon atoms, alkenoyl containing 2 to 22 carbon atoms, hydroxyalkenoyl containing 2 to 22 carbon atoms, hexahydrobenzoyl, and cycloalkylalkanoyl containing 5 through 28 carbon atoms.

4,104,178

WATER-BASED FORGING LUBRICANT

Sulekh C. Jain, Shrewsbury, and Charles A. Morris, Grafton, both of Mass., assignors to Wyman-Gordon Company, Worcester, Mass.

Continuation of Ser. No. 625,592, Nov. 24, 1975, Pat. No. 3,983,042. This application Aug. 9, 1976, Ser. No. 712,702

Int. Cl.[2] C10M *3/04*

U.S. Cl. 252—30 **4 Claims**

1. A forging lubricant comprising:

(a) from about 0.5% to 1.5% by weight of an organic thickener selected from the group consisting of sodium carboxymethylcellulose and hydroxypropylcellulose,

(b) from about 8% to 16% by weight of graphite,

(c) from about 2% to 5% by weight of sodium pentaborate,

(d) from about 4% to 8% by weight of sodium molybdate, and

(e) water base of sufficient percentage by weight to complete a 100% by weight mixture.

4,104,179

LUBRICATING AND PETROLEUM FUEL OIL COMPOSITIONS CONTAINING AZOLE POLYSULFIDE WEAR INHIBITORS

Terence Colclough, Oxford, Great Britain, assignor to Exxon Research & Engineering Co., Linden, N.J.

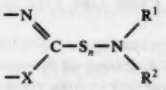
Filed Jan. 30, 1976, Ser. No. 653,935

Claims priority, application United Kingdom, Feb. 14, 1975, 6354/75

Int. Cl.[2] C10M *1/48*

U.S. Cl. 252—32.7 E **8 Claims**

1. An oil composition comprising a major amount of lubricating oil, a minor but at least a metal wear inhibiting amount of an azoleamino polysulfide or an azine aminopolysulfide of the structure:

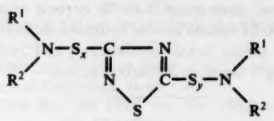


where the group

forms part of a 5-membered azole heterocyclic ring or a 6-membered azine heterocyclic ring, n is at least 2, X is 0, S, or NR^3 where R^3 is H or a lower alkyl group and R^1 and R^2 which are the same or different are hydrogen, a hydrocarbyl group containing from 1 to 25 carbons or one part of a ring of the class consisting of morpholino, piperidino and piperazino and a minor but at least dispersing amount of a lubricating oil ashless dispersant.

2. An oil composition according to claim 1 containing in addition a minor but at least oxidation-inhibiting amount of a zinc dialkyldithiophosphate and said polysulfide is morpholino benzothiazole disulfide.

7. An oil composition comprising a major amount of a lubricating oil and a minor but at least metal wear inhibiting amount of an azole polysulfide of the general formula:



wherein at least one of X and Y is at least 2, and R^1 and R^2 which are the same or different are hydrogen, a hydrocarbyl group containing from 1 to 25 carbons or one part of a ring of the class consisting of morpholino, piperidino and piperazino.

8. An oil composition comprising a major amount of a lubricating oil and a minor but at least metal wear inhibiting amount of an azole polysulfide of the general formula:

where at least one of *x* and *y* is at least 2 and R^1 and R^2 which are the same or different are hydrogen, a hydrocarbyl group containing from 1 to 25 carbons or one part of a ring of the class consisting of morpholino, piperidino and piperazino.

4,104,180
PRODUCTION OF OVERBASED METAL PHENATES

Victor Charles Ernest Burnop, Wantage, England, assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 687,557, May 18, 1976, abandoned. This application Apr. 28, 1977, Ser. No. 791,714

Claims priority, application United Kingdom, May 23, 1975, 22510/75

Int. Cl.[2] C10M *1/40, 3/34, 5/22, 7/38*

U.S. Cl. 252—33 **26 Claims**

1. A process for preparing an oil soluble overbased metal additive, useful as a lubricating oil detergent and having a total base number of about 150 to 400, comprising the following steps:

(i) forming a reaction mixture comprising:

(a) an alkaline earth metal alkoxyalkoxide together with alkoxyalcohol to serve as solvent,

(b) a surfactant selected from the group consisting of C_{18} to C_{30} sulphonic acid, metal sulphonate of said sulphonic acid, hydrocarbyl substituted phenols, metal phenates and sulphurised phenols, having one or more hydrocarbyl group substituents each substituent containing at least 9 and up to 60 carbon atoms, or mixtures of said surfactants with each other,

(c) a non-volatile diluent oil, and

(d) at least one mole of water for every gram atom of the alkaline earth metal present in excess of the amount of the metal required to neutralise the surfactant,

(ii) hydrolysing the alkaline earth metal alkoxyalkoxide by heating the mixture to a temperature from 50° to 100° C.,

(iii) introducing carbon dioxide into the reaction mixture at a temperature below about 100° C. to thereby form said overbased metal phenates, and

(iv) removing volatiles from the reaction mixture, and wherein there are about 2 to 5 equivalents of metal alcoholate per equivalent of surfactant.

4,104,181
ADDITIVES COMPRISING (N, N-DIORGANOTHIOCARBAMYL) PHOSPHOROTHIOITES AND LUBRICANT COMPOSITIONS CONTAINING THE SAME

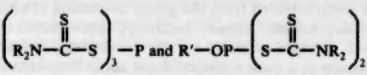
Phillip S. Landis, Woodbury, and Abraham O. M. Okorodudu, West Deptford, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,368

Int. Cl.[2] C10M *1/48, 3/42, 5/24, 7/46*

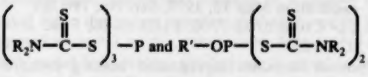
U.S. Cl. 252—46.7 **26 Claims**

1. A lubrication composition comprising a major amount of an oil of lubricating viscosity or grease prepared therefrom and a minor load-carrying amount of a compound selected from the group consisting of compounds of the following general formulae:



or mixtures thereof where R and R′ are alkyl of 1 to 32 carbon atoms, aryl of 6 to 32 carbon atoms or alkaryl of 7 to 32 carbon atoms, and where R and R′ are also selected from (C_nH_{2n-1}) where *n* is from 3 to about 20 and R is also selected from $(CH_2)_n$ in heterocyclic systems with *n* being from 2 to about 10.

16. A compound selected from the groups consisting of compounds of the following general structure:



where R and R′ are alkyl of 1 to about 32 carbon atoms, aryl of 6 to 32 carbon atoms or alkaryl of 7 to 32 carbon atoms and where R and R′ are also selected from (C_nH_{2n-1}) where *n* is from 3 to 20 and R may be selected from $(CH_2)_n$ in heterocyclic systems where *n* is from 2 to 10.

4,104,182
LUBRICATING OIL COMPOSITION

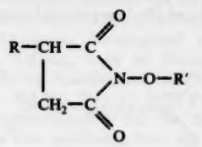
Kechia J. Chou, Fishkill, and Walter W. Hellmuth, Hopewell Junction, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed May 16, 1977, Ser. No. 796,915

Int. Cl.[2] C10M *1/32, 3/26, 5/20, 7/30*

U.S. Cl. 252—51.5 A **16 Claims**

1. A lubricating oil composition comprising a major portion of a hydrocarbon oil of lubricating viscosity, a minor amount of a metal-containing additive characterized by promoting the formation of hard deposits in an internal combustion engine and an effective deposit softening amount of a hydrocarbon-substituted N-hydrocarbyloxy succinimide represented by the formula:



in which R is a hydrocarbon radical having from 1 to 50 carbon atoms and R′ is a hydrocarbon radical having from 3 to 20 carbon atoms.

4,104,183

LIQUID DEVELOPER FOR USE IN ELECTROSTATIC PHOTOGRAPHY COMPRISING NATURAL RESINS AND NATURAL RESIN-MODIFIED THERMOSETTING RESINS COMBINED WITH POLYMERS

Kazuo Tsubuko, and Yasuo Kizu, both of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1976, Ser. No. 751,097
Claims priority, application Japan, Dec. 24, 1975, 50-154429
Int. Cl.[2] G03G 9/12
U.S. Cl. 252—62.1 L 11 Claims

1. A liquid developer for use in electrostatic photography consisting essentially of a toner dispersed in a carrier liquid having a high resistivity and a low dielectric constant, said toner consisting essentially of pigment or dye particles and a non-aqueous resin dispersion, said non-aqueous resin dispersion consisting essentially of a non-aqueous solvent having a high insulating property and a low dielectric constant selected from the group consisting of aliphatic hydrocarbons and halogen derivatives thereof, said solvent having dispersed therein at least one resin which is substantially insoluble in said solvent, said resin being selected from the group consisting of natural resins and natural resin-modified thermosetting resins, said solvent also having dispersed therein a polymer of at least one monomer A which has the formula

wherein R is hydrogen or CH_3, D is $-COOC_nH_{2n+1}$ or $-OC_nH_{2n+1}$, and n is an integer ranging from 6 to 20, said monomer A being capable of dissolving said resin, the weight ratio of said resin:said polymer being in the range of from about 5–50:50–95, said polymer being solvated by said solvent.

4,104,184

ELECTRICAL DEVICES CONTAINING SELECT VINYLSILOXANE DIELECTRIC FLUIDS

William T. Brooks, and Gary A. Vincent, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed May 9, 1977, Ser. No. 794,878
Int. Cl.[2] H01B 3/46, 3/24, 3/20
U.S. Cl. 252—63.7 3 Claims

1. In an electrical device containing a dielectric fluid, the improvement comprising employing as the dielectric fluid $CH_2{=}CH(CH_3)_2SiOSi(CH_3)_2CH{=}CH_2$.

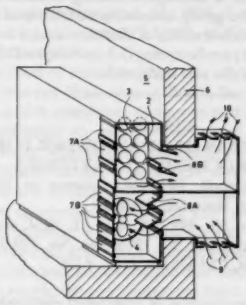
4,104,185

LATENT HEAT ACCUMULATOR

Johann Schröder, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 14, 1976, Ser. No. 676,649
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1975, 2517920
Int. Cl.[2] C09K 5/06
U.S. Cl. 252—70 4 Claims

1. A method of operating a latent heat accumulator including a heat-energy storage medium, which comprises utilizing a heat-energy storage medium consisting essentially of a potassium fluoride-water system having a potassium fluoride content between 44 and 48% by weight.



4,104,186

ORGANOSILICON ANTI-FOAMING COMPOSITIONS

Jean-Claude Caffarel, Decines, and Bernard Papillon, La Mulatiere, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed May 6, 1977, Ser. No. 794,522
Claims priority, application France, May 11, 1976, 76 14094
Int. Cl.[2] C11D 3/065
U.S. Cl. 252—89 R 12 Claims

11. A composition which comprises a powdered detergent in admixture with a composition comprising:

A. from about 2% to about 50% by weight of organosilicon anti-foaming agents, and

B. from about 98% to sbout 50% of particulate solid carriers of the general formula $(CH_3)_a(HO)_b(RO)_cSiO(4-a-b-c)/2$, in which the symbol "*R*" represents a methyl, ethyl, n-propyl, isopropyl, or n-butyl radical, the symbol "*a*" represents any number ranging from about 0.8 to about 1.1, the symbol "*b*" represents any number ranging from about 0.002 to about 0.2, and the symbol "*c*" represents any number ranging from about 0 to about 0.2.

4,104,187

COMPOSITION AND METHOD TREATING SOFT CONTACT LENSES AT ELEVATED TEMPERATURES

Murray J. Sibley, Berkeley; Gordon H. K. Yung, Sunnyvale, and Petronio D. Urrea, Sunol, all of Calif., assignors to Barnes-Hind Pharmaceuticals, Inc., Sunnyvale, Calif.

Filed Apr. 12, 1976, Ser. No. 676,280
Int. Cl.[2] C11D 1/84, 1/48
U.S. Cl. 252—106 5 Claims

1. A soft lens thermal disinfecting and cleaning solution consisting essentially of:

an aqueous isotonic saline solution buffered with a physiologically acceptable buffer at a pH in the range of about 6.5–7.6, having a physiologically acceptable preservative system comprising at least one member of the group consisting of ethyl(2-mercaptobenzato-S) mercury sodium salt, ethylene diamine tetraacetic acid and sorbic acid, and from 0.001–0.1w/v of a fatty acid amide of 10 to 18 carbon atoms of diethanolamine.

3. A method for disinfecting and cleaning soft contact lenses which comprises heating said lenses in a solution at a temperature of at least 60° C for a time sufficient to disinfect and clean such soft contact lens, said solution consisting essentially of:

an aqueous saline solution buffered with a physiologically acceptable buffer to a pH in the range of 6.5–7.6 having a physiologically acceptable perservative system comprising at least one member of the group consisting of ehtyl(2-

mercaptobenzato-S)mercury sodium salt, ethylene diamine tetraacetic acid and sorbic acid in a total amount of from about 0.001 to 0.1 weight percent and from about 0.001–0.1w/v of a non-eye irritating neutral surfactant selected from the group consisting of fatty acid amides of from 10 to 18 carbon atoms of diethanolamine and 2-undecyl-3-(2'-carboxymethoxyethyl)-3-carboxymethyl-1-imidazoline disodio salt hydroxide.

4,104,188

PRODUCTION OF ZINC POWDER FOR ELECTROCHEMICAL BATTERIES

Robert Nicaise, Neerpelt, Belgium, assignor to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Continuation of Ser. No. 499,346, Aug. 21, 1974, abandoned. This application Jul. 27, 1976, Ser. No. 709,070

Int. Cl.[2] H01M *4/42, 4/26*

U.S. Cl. 252—182.1 **2 Claims**

1. A process for production of powdered electrode material for use in electrochemical batteries which use zinc powder and mercury as the electrode material, which process comprises

(a) mixing molten zinc with an amount of mercury effective to inhibit gassing,

(b) subjecting the molten mixture resulting from step (a) to a homogenizing treatment to obtain a homogenized molten alloy of zinc and mercury,

(c) subjecting the homogenized molten alloy from step (b) to atomization to obtain a zinc-mercury alloy in powder form, each grain of said powder consisting of the same homogeneous zinc-mercury alloy.

4,104,189

CURING AGENT FOR POLYSULFIDE-POLYMER COMPOSITIONS

Askan Hertwig, Seelze, and Horst Krampitz, Lohnde, both of Fed. Rep. of Germany, assignors to Riedel-de Haen Aktiengesellschaft, Seelze, Hannover, Fed. Rep. of Germany

Filed Dec. 16, 1976, Ser. No. 751,071

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1975, 2557012

Int. Cl.[2] C08F *28/00*; C08G *75/14*

U.S. Cl. 252—186 **8 Claims**

1. A curing agent for polysulfide polymer compositions based on manganese(IV) oxide containing from 1 to 15% by weight, based on the weight of manganese(IV) oxide, of metal other than manganese selected from alkali metals, foreign metals and mixtures thereof, and from 0.1 to 8% by weight of water, said manganese(IV) oxide having a specific surface of 5 to 20 m^2/g.

2. A process for the manufacture of a curing agent for polysulfide polymers which comprises treating an oxidic manganese compound having an oxidation number of 2 to 4 with an alkali lye at a temperature of 120° to 400° C. under a pressure of 1 to 15 bars, washing the resulting material with water which may contain up to 10% of acid to produce a lattice containing from 0.1 to 15% by weight of alkali metal, grinding the washed material to a specific surface of 5 to 20 m^2/g and drying it to a water content of 0.1 to 8% by weight.

4,104,190

GENERATION OF CHLORINE DIOXIDE FOR DISINFECTION AND STERILIZATION

Stephen R. Hartshorn, Harlow, England, assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Mar. 21, 1977, Ser. No. 779,696

Claims priority, application United Kingdom, Mar. 23, 1976, 11676/76

Int. Cl.[2] D06L *3/08*; C01B *11/02*

U.S. Cl. 252—187 R **25 Claims**

1. A method of generating chlorine dioxide in an aqueous liquid containing an alkali metal or alkaline earth metal chlorite by adding to the aqueous liquid a water-soluble solid composition containing a chlorine-releasing component consisting of a compound or mixture of compounds which is stable when dry but releases chlorine when dissolved in water, the chlorine released generating chlorine dioxide by reaction with the alkali metal or alkaline earth metal chlorite.

4,104,191

HYDROGEN GENERATION FROM FLUE GASES

Jack Brocoff, Fullerton, Calif., assignor to Ralph M. Parsons Co., Pasadena, Calif.

Continuation-in-part of Ser. No. 450,550, Mar. 13, 1974, Pat. No. 4,012,488. This application Mar. 10, 1977, Ser. No. 776,353

Int. Cl.[2] C09K *3/00*

U.S. Cl. 252—188 **8 Claims**

1. A process for the production of a reducing gas which comprises:

(a) extracting a high temperature gas from a reaction zone at a temperature sufficiently high to promote thermal reactions between an oxidant and an added hydrocarbon;

(b) adding to the extracted high temperature gas a carbon containing fuel in an amount to provide the sum of from about 5 to about 100 mols of carbon and H_2 per 100 mols of extracted gas; and

(c) thermally converting the carbon containing fuel in the presence of a gaseous oxidant provided in a quantity sufficient to convert the carbon present in the fuel to carbon monoxide, but insufficient to convert all of the carbon in the fuel to carbon dioxide to form a resultant high temperature reducing gas containing a reductant selected from the group consisting of hydrogen, carbon monoxide and mixtures thereof.

4,104,192

OXYGEN ABSORBENT

Yoshio Yoshikawa, Ushiku; Akira Amemiya, Kana; Sigeru Kimoto, and Hidenori Kimpara, both of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company Inc., Tokyo, Japan

Filed Jan. 19, 1977, Ser. No. 760,817

Claims priority, application Japan, Jan. 26, 1976, 51-7300

Int. Cl.[2] C09K *15/00*; C01B *17/64*

U.S. Cl. 252—188 **12 Claims**

1. An oxygen absorbent comprising a dithionite and at least one compound having water of hydration.

4,104,193

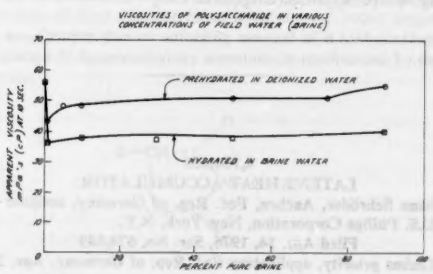
IMPARTING SUPERIOR VISCOSITY TO AQUEOUS POLYSACCHARIDE SOLUTIONS

Walter H. Carter, Houston; Charles A. Christopher, Stafford, and Thomas Jefferson, Houston, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Sep. 13, 1976, Ser. No. 722,976

Int. Cl.[2] E21B *33/138, 43/22*

U.S. Cl. 252—316 **8 Claims**


VISCOSITIES OF POLYSACCHARIDE IN VARIOUS CONCENTRATIONS OF FIELD WATER (BRINE)
PREHYDRATED IN DEIONIZED WATER
HYDRATED IN BRINE WATER
APPARENT VISCOSITY
PERCENT PURE BRINE

1. A method for imparting superior viscosity to an aqueous polysaccharide B-1459 solution wherein the aqueous component is hard water consisting of

prehydrating the polysaccharide in fresh water before mixing with hard water.

4,104,194

METHOD FOR PROTECTING METAL FROM EROSION

Arthur Botta, Krefeld, and Christian Rasp, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

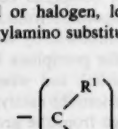
Division of Ser. No. 591,789, Jun. 30, 1975, Pat. No. 4,048,174. This application May 16, 1977, Ser. No. 797,651

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1974, 2435406

Int. Cl.[2] C09K 3/00

U.S. Cl. 252—390 8 Claims

1. Method for protecting metal from erosion comprising treating the metal with a compound having the formula



(I)

wherein

A is an arylene radical and

B is unsubstituted or halogen, lower alkyl, CF_3, alkoxy, aryloxy or dialkylamino substituted alkylene chain

wherein

R^1 and R^2 individually represent hydrogen and/or unsubstituted or halogen, lower alkyl, CF_3, alkoxy, aryloxy or dialkylamino substituted aliphatic, cycloaliphatic, araliphatic or aromatic radicals and

n represents a number from 3 to 6,

or

B is unsubstituted or a halogen, lower alkyl, CF_3, alkoxy, aryloxy or dialkylamino substituted 1,8-naphthylene, 2,2'-diohenylene or 4,5-phenanthrylene radical.

4,104,195

BLOWING AGENTS BASED ON UREA DICARBOXYLIC ACID ANHYDRIDE

Kurt Ley, Odenthal-Gloebusch; Hermann Hagemann, Cologne, and Helmut Hurnik, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sep. 25, 1975, Ser. No. 616,523

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1974, 2452740

Int. Cl.[2] C09K 3/00; C08J 9/08

U.S. Cl. 252—350 2 Claims

1. A blowing agent composition comprising 10 to 80% by weight of urea dicarboxylic acid anhydride, 0–90% by weight of at least one water-eliminating compound and the balance, if any, being at least one known blowing agent, said blowing agent composition decomposing without giving off any corrosive, discoloring, unpleasant smelling or toxic decomposition products.

4,104,196

NONABSORBABLE ANTIOXIDANT METHOD

Alejandro Zaffaroni, Atherton, Calif., assignor to Dynapol, Palo Alto, Calif.

Division of Ser. No. 367,971, Jun. 7, 1973, Pat. No. 3,994,828. This application Mar. 15, 1976, Ser. No. 666,845

Int. Cl.[2] C09K 15/08

U.S. Cl. 252—404 2 Claims

1. A method of restricting the rate of oxidation of an edible material selected from among foods, beverages and pharmaceuticals which comprises adding to said edible material in an amount sufficient to restrict the rate of oxidation thereof a nonabsorbable nonnutritive antioxidant consisting essentially of a compound having a molecular weight in excess of 1000 and having the formula $(AN\text{-})_nR$ wherein An is an antioxidant capable of substantially retarding the rate of oxidation of an oxidizable material, *n* is a number having a value of at least 1, R is a polymeric restricting means which is essentially nonmetabolizable and nonbiodegradable under the conditions of passage through the gastrointestinal tract, and ~ is a covalent bond that substantially maintains its physical and chemical integrity under the conditions of passage through the gastrointestinal tract and wherein during passage of $(AN\text{-})_nR$ through the gastrointestinal tract, the restricting means, R, substantially prevents passage of $(AN\text{-})_nR$ from the gastrointestinal lumen through the gastrointestinal mucosa into the systemic circulation.

4,104,197

METHOD OF MAKING GAS DIFFUSION ELECTRODES FOR ELECTROCHEMICAL CELLS WITH ACID ELECTROLYTES

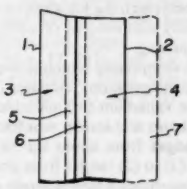
Jochen Heffler, Grossauheim, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Germany

Division of Ser. No. 749,663, Dec. 13, 1976. This application May 23, 1977, Ser. No. 799,601

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1975, 2556731

Int. Cl.[2] H01M 4/88

U.S. Cl. 252—425.3 1 Claim



1. A method of forming a gas diffusion electrode for electrochemical cells with acid electrolytes comprising, mixing hard coal powder with a most common particle size of about 10 to 25 microns with polytetrafluorethylene or the like in a suspension medium to form a first pulp, pressing the first pulp into a first body, cutting a skin from the first body, rolling the skin to a thickness of about up to 0.4 mm to form a prerolled hydrophobic layer, mixing catalyst containing activated carbon powder with a most common particle size of about 0.5 microns with polytetrafluorethylene or the like in a suspension medium to form a second pulp, pressing the second pulp into a second body, cutting skins from the second body, rolling the skins to a thickness of about 0.6 mm to form a prerolled hydrophilic layer, superposing the prerolled hydrophilic and hydrophobic layers, and sintering the layers together with heat and under pressure and in an inert atmosphere to form the electrode with final thicknesses, of up to 0.2 mm for the hydrophobic layer and of about 0.3 mm for the hydrophilic layer, wherein the most frequent pore diameter of the hydrophobic and hydrophilic layers is 1.8 microns and 0.08 microns respectively.

4,104,198

HIGH YIELD COMPLEX CATALYST FOR POLYMERIZING OLEFINS

James A. May, Jr., and Wilbur L. Bressler, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 14, 1976, Ser. No. 705,311
Int. Cl.[2] B01J *31/02*
U.S. Cl. 252—429 B 10 Claims

1. A catalytic reaction product of (A) a hydrocarbonsoluble complex of a halide of a transition metal selected from Groups 4*b*, 6*b*, 7*b* and 8 of the Periodic Table wherein the complex contains at least one coordinate covalent bond to molecular nitrogen or hydrogen, (B) an organometallic compound wherein the metal thereof is a divalent non-transition metal selected from Groups 2*a* and 2*b* of the Periodic Table and the organo portion of said organometallic compound is selected from alkyl, aryl, dialkyl, diaryl, aryl hydride, alkyl hydride, alkyl halide and aryl halide, and (C) a halide source selected from the group consisting of (1) hydrogen halides, (2) active organic hydrocarbyl halides and (3) metallic halides represented by the formula $MR_{y-a}X_a$ wherein M is a metal of Group 3*a* or 4*a*, R is a monovalent organic hydrocarbyl radical, X is a halogen, Y corresponds to the valence of M and *a* is a number from 1 to *y*, the proportions of the foregoing components of said catalytic reaction product being such that the atomic ratio of the divalent nontransition metal to the transition metal is within the range from about 10:1 to about 2000:1, and the atomic ratio of the divalent metal to X is within the range from about 0.1:1 to about 2.5:1.

4,104,199

CATALYST FOR THE POLYMERIZATION OF ETHYLENE OR MIXTURES OF ETHYLENE WITH TERMINAL OLEFINS

Glen R. Hoff, Naperville, Ill., assignor to Standard Oil Company a corporation of Indiana, Chicago, Ill.

Continuation-in-part of Ser. No. 645,708, Dec. 31, 1975, abandoned. This application Apr. 25, 1977, Ser. No. 790,194
Int. Cl.[2] C08F *4/64, 4/16*
U.S. Cl. 252—430 7 Claims

1. A catalyst for polymerizing ethylene or ethylene containing up to about twenty mol percent of another polymerizable terminal olefin comprising:

(a) a solid catalyst component which is the reaction product of (1) hydrated magnesium stannate, (2) a lower alkyl titanium (IV) or vanadium (V) alkoxide, and (3) a lower alkyl alkylaluminum dichloride, wherein the weight ratio of (2) to (1) ranges from about 0.1 to about 5 and the weight ratio of (3) to (2) ranges from about 2 to about 30, said reaction comprising a step wherein at least (1) and (2) are reacted at a temperature ranging from about 25° to about 150° C; and

(b) a lower alkyl organoaluminum compound selected from the group consisting of trialkylaluminum, dialkylaluminum hydrides, dialkylaluminum halides and mixtures thereof in an amount, exceeding about 2 millimols per gram of solid catalyst component, said amount being effective to promote the activity of the solid catalyst component.

4,104,200

HYDROGENATING CATALYST

Donald C. Cronauer, Gibsonia, and William L. Kehl, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 6, 1976, Ser. No. 707,521
Int. Cl.[2] B01J *21/04, 23/78, 23/88*
U.S. Cl. 252—465 4 Claims

1. A hydrogenation catalyst comprising a magnesium-deficient magnesium aluminate spinel of the following formula:

$$Mg_xAl_2O_{3+x}$$

wherein x is a number ranging from about 0.10 to about 0.40, carrying nickel, titanium and molybdenum.

4,104,201

CATALYTIC STEAM REFORMING AND CATALYSTS THEREFOR

Reginald George Sinclair Banks; David James Paterson, and Alan Williams, all of Solihull, England, assignors to British Gas Corporation, London, England

Continuation of Ser. No. 609,486, Sep. 2, 1975, abandoned. This application Dec. 27, 1976, Ser. No. 754,513
Claims priority, application United Kingdom, Sep. 6, 1974, 39048/74
Int. Cl.[2] B01J *21/04, 23/46, 23/74*
U.S. Cl. 252—466 B 7 Claims

1. A process for the preparation of a low temperature steam reforming catalyst, said catalyst comprising nickel in an amount of from 25 to 75% nickel, ruthenium in an amount less than 0.8% and alumina, said percentages being calculated as weight percentages of the total calcined but unreduced catalsyt, wherein said process comprises coprecipitation of the nickel and aluminum components from aqueous solutions of nickel and aluminum salts followed by washing, drying, calcination and reduction of the precipitate to reduce the nickel component to metallic nickel, and wherein said ruthenium component is incorporated into the catalyst prior to the reduction step by a step selected from the group consisting of (a) impregnation of the washed, dried and calcined nickel-aluminum containing precipitate, from an aqueous solution of a ruthenium containing salt, or (b) physical blending of a solid ruthenium compound with the washed, dried and calcined nickel-aluminum containing precipitate.

4,104,202

PERFUME COMPOSITIONS AND PROCESS FOR PREPARING SAME

Hans J. Wille, Naarden, Netherlands, assignor to Naarden International N.V., Naarden-Bussum, Netherlands

Filed Mar. 11, 1977, Ser. No. 776,764
Claims priority, application Netherlands, Mar. 15, 1976, 7602686
Int. Cl.[2] C11B *9/00*
U.S. Cl. 252—522 15 Claims

1. A compound for use in a perfume composition having the structural formula

$$R_1-CH_2CH_2CH=CH-\underset{\displaystyle OR_2}{\underset{|}{CH}}-CH_2CH=CH_2$$

wherein R_1 is an alkyl radical having from 1 to 4 carbon atoms and R_2 is selected from the group consisting of hydrogen and formyl radicals and alkyl carbonyl radicals, the alkyl portion of which has 1 or 2 carbon atoms.

8. A composition according to claim 7, wherein R_2 of said alkadiene compound is a CH_3CO radical.

4,104,203

PERFUME COMPOSITIONS CONTAINING CATECHOL-CAMPHENE REACTION PRODUCTS

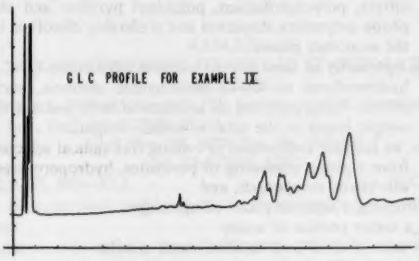
John B. Hall, Rumson, and Wilhelmus Johannen Wiegers, Red Bank, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 753,618, Dec. 22, 1976, Pat. No. 4,061,686, which is a continuation-in-part of Ser. No. 662,818, Mar. 1, 1976, Pat. No. 4,014,944. This application Oct. 31, 1977, Ser. No. 846,960

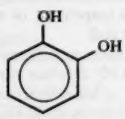
The portion of the term of this patent subsequent to Mar. 29, 1994, has been disclaimed.

Int. Cl.[2] C11B *9/00*

U.S. Cl. 252—522 4 Claims



1. A perfume composition comprising a product produced according to a process which comprises reacting catechol having the structure:



with camphene having the structure:

in the presence of a Friedel Crafts Catalyst to form a catechol-camphene alkylation product, recovering said alkylation product at a temperature in the range of from 186° up to 236° C and at a pressure of from 2.3 up to 3.8 mm Hg, hydrogenating the said catechol-camphene alkylation product in the presence of a hydrogenation catalyst to form a hydrogenated catechol-camphene addition product and recovering the said hydrogenated catechol-camphene addition product at a temperature in the range of from 150° C up to 172° C and a pressure of about 2.5 mm Hg, the Friedel Crafts Catalyst being selected from the group consisting of boron trifluoride etherate, sulfuric acid, acid clay, aluminum trichloride, boron trifluoride, boron trifluoride-acetic acid, boron trifluoride-phosphoric acid, zinc chloride, aluminosilicate molecular sieve, and ferric chloride, the reaction between catechol and camphene being carried out at a temperature in the range of from about 120° C up to 175° C and the mole ratio of catechol to camphene being in the range of from about 0.5:1 up to about 4:1, the hydrogenation reaction being carried out within a temperature range of 100° C up to 300° C, the latter portion of the reaction time being at from 200° up to 300° C in a perfuming amount, and at least one perfume adjuvant selected from the group consisting of an alcohol, an aldehyde, a hydrocarbon, a nitrile, an ester, a lactone, a natural essential oil, and a mixture of two or more alcohols, aldehydes, nitriles, esters, hydrocarbons, lactones and natural essential oils.

4,104,204

PHOTOSENSITIZATION OF OXYGEN TO THE SINGLET EXCITED STATE USING ION EXCHANGE RESIN TO WHICH IS ATTACHED A DYE AND PHOTOOXIDATIVE WASTE WATER TREATMENT

John R. Williams, St. Davids, Pa., assignor to Temple University, Philadelphia, Pa.

Division of Ser. No. 496,069, Aug. 9, 1974, Pat. No. 4,008,136. This application Jun. 25, 1976, Ser. No. 699,706

Int. Cl.[2] B01J *1/10, 31/08;* C02C *5/04*

U.S. Cl. 521—32 4 Claims

1. A composition comprising an ion exchange resin to which is attached a photosensitizing dye capable of exciting ground state oxygen to the singlet excited state.

4. A composition, as recited in claim 1 wherein said photosensitizing dye, capable of exciting ground state oxygen to the singlet excited state, is rose bengal, eosin Y, alizarin red S, congo red, orange G, methylene blue, crystal violet, proflavine sulfate, neutral red, or pyronin B.

4,104,205

MICROWAVE DEVULCANIZATION OF RUBBER

Donald S. Novotny, Windsor, Vt.; Richard L. Marsh, Springfield, Mo.; Frank C. Masters, Palmyra, Nebr., and David N. Tally, Arvada, Colo., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 6, 1976, Ser. No. 646,821

Int. Cl.[2] C08F *2/46*

U.S. Cl. 260—2.3 10 Claims

1. The method of devulcanizing sulfur-vulcanized elastomer containing polar groups which comprises applying a controlled dose of microwave energy of between 915 and 2450 MHz and between 41 and 177 watt-hours per pound in an amount sufficient to sever substantially all carbon-sulfur and sulfur-sulfur bonds and insufficient to sever significant amount of carbon-carbon bonds.

4,104,206

PROCESS FOR REPROCESSING ATACTIC POLYPROPYLENE

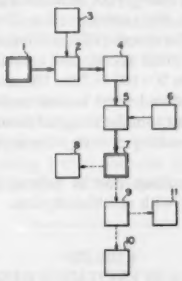
Takeshi Hachisu, and Akinari Uchida, both of Niihari, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 17, 1976, Ser. No. 667,470

Claims priority, application Japan, Mar. 19, 1975, 50-32220

Int. Cl.[2] C08F *6/00*

U.S. Cl. 260—2.3 4 Claims



1. A process for reprocessing normally tacky atactic polypropylene, produced in the preparation of a particulate polypropylene, to a freeflowing particulate form comprising

(a) cooling the tacky atactic polypropylene at a low temperature sufficient to cause embrittlement of said atactic polypropylene;

(b) crushing the embrittled atactic polypropylene to about the same particle size as that of said polypropylene;

(c) depositing a non-tacky fine powder on the surface of said particulate atactic polypropylene; and

(d) raising the temperature of said particulate atactic polypropylene having a surface deposit of said fine powder to room temperature where said particular atactic polypropylene is free-flowing.

4,104,207

PROCESS FOR PRODUCTION OF CELLULAR CAVITIES IN THERMOPLASTIC MATERIAL IN WHICH THE MEDIUM WHICH FORMS THE GAS BUBBLES IS BOUND TO A CARRIER

Hans Dieter Pelikan, Am Prinzenwaldchen 13, and Siegfried Titz, Im Laar 25, both of 521 Troisdorf, Germany, assignors to Hans Dieter Pelikan and Siegfried Titz, both of Germany

Filed Apr. 5, 1976, Ser. No. 673,528

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1975, 2514691

Int. Cl.[2] C08J *9/12*

U.S. Cl. 521—84 **35 Claims**

1. A process for the production of cellular cavities in thermoplastic plastic material, said material being suitable for use as molding compositions or for extrusion, comprising addding to the material a carrier having bound thereto, by at least one of molecular bonding or capillary bonding, a medium which forms gas bubbles, the bond being such that there is direct communication between the medium and the material, whereby, when the temperature of the thermoplastic plastic material is above the minimum temperature at which the medium forms the gas bubbles, the bubbles are formed and act to produce cellular cavities in the thermoplastic plastic material.

4,104,208

PROCESS FOR PREPARATION OF HARD AND POROUS POLYVINYLALCOHOL GELS

Shiro Kido, Hoya; Yuji Saito, Yokohama, and Toshinao Iwaeda, Tokuyama, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Dec. 1, 1976, Ser. No. 746,532

Claims priority, application Japan, Mar. 9, 1976, 51-24693

Int. Cl.[2] C08J *9/00*

U.S. Cl. 521—53 **4 Claims**

1. A process for the preparation of hard and porous polyvinyl alcohol gels for aqueous gel permeation chromatography, which comprises:

suspension-polymerizing a mixture of vinyl acetate and at least one crosslinking agent selected from the group consisting of diethylene glycol dimethacrylate and glycidyl methacrylate, in the presence of a diluent, wherein the weight ratio of the amount of said diluent to the amount of said mixture of vinyl acetate and crosslinking agent is in the range of from 50 : 100 to 250 : 100, and the weight ratio of the amount of said vinyl acetate to the amount of said crosslinking agent is in the range of from 90 : 10 to 30 : 70.

saponifying the resulting porous polyvinyl acetate gel with an alkali; and

subjecting the resulting porous polyvinyl alcohol gel to postcrosslinking with epichlorohydrin.

4,104,209

HIGHLY POROUS ION EXCHANGE RESINS PREPARED BY SUSPENSION POLYMERIZATION IN THE PRESENCE OF LINEAR POLYMER

John A. Mikes, Cherry Hill; Albert H. Greer, Haddonfield, both of N.J., and Amos Norwood, Philadelphia, Pa., assignors to Sybron Corporation, Rochester, N.Y.

Filed Jul. 6, 1976, Ser. No. 703,067

Int. Cl.[2] C08J *9/00*

U.S. Cl. 521—62 **6 Claims**

1. A process for the preparation of crosslinked copolymer beads suitable for conversion to ion exchange resins having improved mechanical properties, improved chemical properties and porosity of 0.14 to 0.85 ml/g by octane absorption which comprises the steps of

(a) forming a liquid monomer phase comprising:

i. a mixture of mono-olefinic monomer(s) and at least one poly-olefinic monomer which are miscible and copolymerizable, said mono-olefinic monomer selected from a group consisting of mono-vinyl aromatic hydrocarbons, mono-vinyl heterocylic compounds, and (meth)acrylic esters, and said polyolefinic monomers selected from the group consisting of polyvinyl aromatic hydrocarbons, poly(meth)acrylates and polyvinyl heterocylic compounds,

ii. from 5–20 parts by weight of total monomers of a linear polymer component selected from a group consisting of cellulose acetate butyrate, cellulose acetate, cellulose nitrate, polycaprolactam, polyvinyl pyridine and aliphatic polyesters, dispersed and preferably dissolved in the monomer phase,

iii. optionally an inert solvent selected from either C_6–C_{10} hydrocarbons or C_3–C_6 monohydric alcohols, such solvent being included in amounts of 0–50 percent by weight based on the total monomer weight,

iv. an initiator component providing free radical selected from a group consisting of peroxides, hydroperoxides, azo/nitrile compounds, and

(b) forming a aqueous phase comprising:

i. a major portion of water

ii. salts of alkali and/or alkali earth metals

iii. hydrophilic polymer(s) selected from a group consisting of gelatin, casein, starch, polyvinyl alcohol, maleic acid copolymer(s), poly(meth)acrylic acid derivatives; and

(c) combining said monomer phase (a) and said aqueous phase (b) to form a suspension of said monomer phase in said aqueous phase and

(d) heating said suspension to polymerization temperature of between 50° C and 90° C while stirring said dispersion to form a multiplicity of macroporous polymer beads, and

(e) separating said macroporous beads from the aqueous phase.

4,104,210

THERMOPLASTIC COMPOSITIONS OF HIGH UNSATURATION DIENE RUBBER AND POLYOLEFIN RESIN

Aubert Y. Coran, and Raman P. Patel, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 17, 1975, Ser. No. 641,547

Int. Cl.[2] C08L *7/00, 23/00*

U.S. Cl. 260—4 R **20 Claims**

1. An elastomeric thermoplastic composition comprising a blend of about 25–45 parts by weight of crystalline thermoplastic polyolefin resin and about 75–55 parts by weight of vulcanized high unsaturation diene rubber particles of a size below about 50 microns dispersed throughout said resin per 100 total parts by weight of resin and rubber, which rubber is a homopolymer of a diolefin or copolymer in which the major component of the polymer chain is derived from a diolefin.

4,104,211

SEALANTS

David Edward Keene, and Anthony Frederick Douglas, both of London, England, assignors to British Gas Corporation, London, England

Continuation-in-part of Ser. No. 507,620, Sep. 19, 1974, abandoned. This application Jun. 18, 1976, Ser. No. 697,362

Claims priority, application United Kingdom, Sep. 25, 1973, 44845/73

Int. Cl.[2] C08L *89/00*

U.S. Cl. 260—8 **12 Claims**

1. A sealant composition for sealing leaks in gas transmission or distribution pipes comprising an aqueous anionic or non-

ionic emulsion of bitumen and rubber containing an anionic or non-ionic emulsifier in which emulsion is incorporated a flow modifier comprising a colloidal stabilizer selected from the group consisting of casein, methyl cellulose, hydroxyethyl cellulose and polymers and copolymers of acrylic acid and salts or esters of polyacrylic acid alone or in conjunction with bentonite clay or china clay and a modifier selected from the group consisting of fillers and soluble alkali wherein the rubber and bitumen content of the emulsion is at least 50% by weight of the total solids content of the sealant, the total solids content of the sealant is from 30 - 72% by weight, the apparent viscosity of the emulsion is not greater than 500 poise at a shear rate of one reciprocal second and the concentration of flow modifier is such that the yield stress of the sealant ranges from 100 to 500 dynes/cm^2.

4,104,212

NON-BIREFRINGENT GRANULAR STARCH LATEX THICKENER

Robert L. Bruner, Hinsdale, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Nov. 26, 1976, Ser. No. 745,147
Int. Cl.^{2} C08L *3/02*
U.S. Cl. 260—17.3 **16 Claims**

10. A product useful as a thickening agent for latex comprising:

(a) a substantially non-birefringent, cold water swelling, granular starch product characterized as having a viscosity from about 150 to about 650 centipoise at 10 percent solids after being dispersed in water at 1500 rpm for 2 minutes;

(b) tricalcium monophosphate from about 2% to about 10% by weight; and

(c) a hydrophobic agent.

4,104,213

STARCH REPLACEMENT FOR LATEX POLYMER

Mutong T. Chiang, Palos Heights, and John P. Gibbons, Western Springs, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Nov. 26, 1976, Ser. No. 745,145
Int. Cl.^{2} C08L *3/02*
U.S. Cl. 260—17.3 **25 Claims**

1. In a latex composition comprising water, polymer solids and thickener, the improvement wherein said thickener comprises a substantially non-birefringent, cold water swelling, granular starch product having an "A" pattern X-ray diffraction and characterized as having less than 10% solubles and a swelling power such that 5 g. thereof dispersed in water for 16 hours at 25° C. swells from about 20 ml. to about 35 ml.

4,104,214

FLUID ABSORBENT CELLULOSE FIBERS CONTAINING ALKALINE SALTS OF POLYMERS OF ACRYLIC ACID, METHACRYLIC ACID OR AN ACRYLOAMIDOALKANE SULFONIC ACID WITH ALIPHATIC ESTERS OF ACRYLIC ACID OR METHACRYLIC ACID

Alan W. Meierhoefer, Gaithersburg, Md., assignor to Akzona Incorporated, Asheville, N.C.

Filed Dec. 1, 1976, Ser. No. 746,539
Int. Cl.^{2} C08L *1/02*
U.S. Cl. 260—17.4 CL **15 Claims**

1. A fluid absorbent cellulose fiber containing in an admixture with cellulose an alkali metal salt or ammonium salt of a polymer having repeating units derived from an aliphatic ester of acrylic acid or methacrylic acid and having repeating units derived from at least one member from the group consisting essentially of acrylic acid, methacrylic acid or an anhydride thereof and acrylamidoalkyl sulfonic acid.

4,104,215

ODORLESS OR LOW-ODOR RESINOUS COMPOSITION

Yuji Aimono; Eiji Omori, and Mineo Nakano, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Japan

Filed Jun. 4, 1976, Ser. No. 692,953
Claims priority, application Japan, May 12, 1975, 50-56852
Int. Cl.^{2} C09D *3/58, 3/66, 5/25*
U.S. Cl. 260—22 CB **20 Claims**

1. A resinous composition comprising (a) a low-odor cross-linkable monomer obtained by reacting a glycidyl ester of synthetic or vegetable oil fatty acid with acrylic acid or methacrylic acid with heating, and (b) a polybutadiene modified by acrylic acid or methacrylic acid or an unsaturated polyester resin.

4,104,216

COPOLYMERS CONTAINING AN ALPHA-OLEFIN AND AN ALPHA, BETA-ETHYLENICALLY UNSATURATED CARBOXYLIC ACID PLASTICIZED WITH LONG-CHAIN FATTY ACID

Bert H. Clampitt, Houston, Tex., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Mar. 7, 1977, Ser. No. 774,983
Int. Cl.^{2} C08F *10/00, 210/00*
U.S. Cl. 260—23 AR **22 Claims**

1. A plasticized copolymer consisting essentially of at least about 50 mol percent of an alpha-olefin of the formula:

$$RCH = CH_2$$

wherein R is a radical selected from the group of hydrogen and alkyl radicals having from 1 to about 8 carbon atoms; and an alpha, beta-ethylenically unsaturated carboxylic acid having from about 3 to about 8 carbon atoms or the respective salts thereof; said copolymer having a molecular weight of from about 20,000 to about 200,000; and as a plasticizing agent from about 5 weight percent to about 50 weight percent, based on the weight of the copolymer of a long-chain fatty acid selected from saturated and unsaturated fatty acids containing 9 to 11 carbon atoms; said plasticized copolymer having a glass transition temperature below about 0° C.

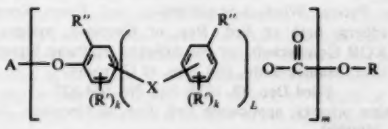
4,104,217

CARBONATE ESTER STABILIZERS FOR POLYMERS

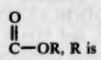
William E. Leistner, Atlantic Beach, N.Y.; Motonobu Minagawa, Kosigaya, Japan; Yutaka Nakahara, Iwatsuki, Japan, and Tohru Haruna, Okegawa, Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Jan. 24, 1977, Ser. No. 761,886
Int. Cl.^{2} C07C *69/00*; C08K *5/10*
U.S. Cl. 260—23 XA **17 Claims**

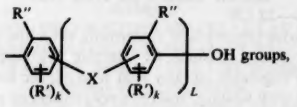
1. As a new composition of matter, a carbonate ester having a molecular weight between 700 and about 7000, of at least one hydrocarbon-substituted phenol, each hydrocarbon-substituted phenol having 2 to 3 phenolic hydroxyl groups disposed on an odd number of benzenoid rings, and having a formula



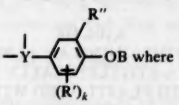
in which independently at each occurrence R' and R'' are selected from the group consisting of alkyl having one to 10 carbon atoms, cycloalkyl having 5 to 10 carbon atoms, and alkylcycloalkyl having 6 to 10 carbon atoms, A is selected from the group consisting of hydrogen and



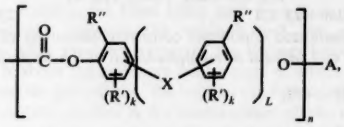
selected from the group consisting of alkyl, aryl, and



X has the structure



Y is a hydrocarbon radical, B is selected from the group consisting of hydrogen and



L is 0 or 1, K is an integer from 0 to 3, *m* is 1 to about 20, and *n* is an average of 0.1 to about 20.

12. A stabilized synthetic resin composition comprising a synthetic resin and a carbonate ester according to claim 1.

14. A stabilized synthetic resin composition according to claim 12 comprising polyvinyl chloride, epoxidized soybean oil, and zinc stearate.

4,104,218

STABILIZED HALOBUTYL RUBBER

Pierre Hous, Steenokkerzeel, Belgium, assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Dec. 21, 1976, Ser. No. 752,866

Claims priority, application United Kingdom, Dec. 30, 1975, 53133/75

Int. Cl.² C08L *91/00*

U.S. Cl. 260—23.7 H **12 Claims**

1. A stabilized halobutyl rubber composition comprising a halobutyl rubber, and a stabilizer, the stabilizer consisting essentially of an alkali metal carboxylate or an alkaline earth metal carboxylate at a level of about 0.01 to about 3.0 equivalents of metal in the metal carboxylate per gm atom of halogen in the halobutyl rubber and an ether at a level of about 0.01 to about 3.0 equivalents of ether oxygen per gm atom of halogen in the halobutyl rubber.

4,104,219

PRINTING INK

Victor Peters, Windach-Schöffelding, and Franz Krammer, Friedberg, both of Fed. Rep. of Germany, assignors to ALKOR Gesellschaft mit beschränkter Haftung Kunststoffverkauf, Munich-Solln, Fed. Rep. of Germany

Filed Dec. 29, 1975, Ser. No. 644,527

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1975, 2500500

Int. Cl.² C09D *11/10*

U.S. Cl. 260—29.6 RB **6 Claims**

1. A printing ink consisting essentially of 70% to 95% by weight of a varnish and 30% to 5% by weight of a pigment stock; said varnish consisting essentially of 10% to 30% by weight of an aqueous dispersion of a polyacrylic acid ester, 1.5% to 4.5% of an aqueous dispersion of a polymethacrylic acid ester, and the remainder of a liquid medium consisting of a homogeneous, neutral to slightly alkaline mixture of a minor amount of water and a major amount of an alkanol having 1 to 3 carbon atoms; said pigment stock consisting essentially of 30% to 55% by weight of an aqueous dispersion of said polyacrylic acid ester, 5% to 20% by weight of a pigment and the remainder of said liquid medium; wherein the amount of said polymethacrylic acid ester in said printing ink is between 3% and 25% of the weight of said polyacrylic acid ester in said printing ink, and wherein the alcohol moieties of said esters are alkyl or cycloalkyl having 1 to 8 carbon atoms.

4,104,220

ALKENYL 1-(2-AMINOETHYL) ALKYLENEUREIDO SUCCINAMATES, THEIR SYNTHESIS, AND USE IN AQUEOUS EMULSION POLYMER SYSTEMS

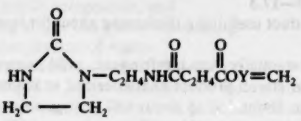
Victor A. Sims, Bayonne, N.J., assignor to Air Products & Chemicals, Inc., Allentown, Pa.

Filed Jul. 29, 1976, Ser. No. 709,916

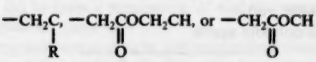
Int. Cl.² C08L *39/04*

U.S. Cl. 260—29.6 R **12 Claims**

1. Compounds of the structural formula:



wherein Y is



and R is H or CH_3.

4,104,221

PROCESS FOR MAKING WATER DILUTED ELECTROINSULATION ENAMELS

Harald Janssen, Reinbek, and Ferdinand Hansch, Wedel, both of Fed. Rep. of Germany, assignors to Dr. Beck & Co., AG, Hamburg, Fed. Rep. of Germany

Filed Aug. 24, 1976, Ser. No. 717,204

Int. Cl.² C08L *77/12*

U.S. Cl. 260—29.2 N **16 Claims**

1. A process of making electro-insulation enamels which are adapted for water dilution,

the said process comprising reacting an aromatic tricarboxylic acid monoanhydride with about equivalent amounts of a diamine, a difunctional alcohol and a trifunctional alcohol which latter in its structure includes an isocyanurate ring so as to obtain a hydroxyl groups containing polyesterimide of an acid number of at most 10,

and then reacting the said polyesterimide with at least one amine and/or aminoalcohol in an amount of 5 to 30% by weight relative to the weight of the esterimide to effect an aminolysis,

whereupon the reaction product is diluted with water until it has the desired viscosity for enameling purposes.

4,104,222

DISPERSION OF LINEAR POLYESTER RESIN

Masakazu Date, Takatsuki, and Masahiro Wada, Moriguchi, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Filed Feb. 13, 1974, Ser. No. 441,990

Int. Cl.² C08J *3/06;* C08G *63/50;* D06M *15/10, 15/68*

U.S. Cl. 260—29.2 E **4 Claims**

1. A dispersion of a linear polyester resin for use in improv-

ing the properties of shaped high polymer articles, said dispersion being obtained by mixing a linear polyester resin with a surface-active agent of the higher alcohol/ethylene oxide addition type, melting the mixture, and dispersing the resulting melt by pouring it into an aqueous solution of an alkanolamine under stirring at a temperature of 70°–95° C, said alkanolamine being selected from the group consisting of monoethanolamine, diethanolamine, triethanolamine, monomethylethanolamine, monoethylethanolamine, diethylethanolamine, propanolamine, butanolamine, pentanolamine, N-phenylethanolamine, and an alkylolamine of glycerine, said alkanolamine being present in the aqueous solution in an amount of 0.2 to 5 weight percent, said surface-active agent of the higher alcohol/ethylene oxide addition type being an ethylene oxide addition product of a higher alcohol having an alkyl group of at least 8 carbon atoms, an alkyl-substituted phenol or a sorbitan monoacylate and wherein said surface-active agent has an HLB value of at least 12.

4,104,223

AQUEOUS EPOXY RESIN PAINT COMPOSITION

Minoru Hosoda, Yokohama; Eiichi Kasiwagi, Fujisawa; Fumio Murayama, Yokohama, and Kohei Isayama, Kamakura, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Division of Ser. No. 509,315, Sep. 25, 1974, Pat. No. 3,903,056. This application Mar. 12, 1976, Ser. No. 666,452

Claims priority, application Japan, Sep. 27, 1973, 48-108808; Sep. 27, 1973, 48-108809; Oct. 1, 1973, 48-110393; Dec. 24, 1973, 48-3633

The portion of the term of this patent subsequent to Sep. 28, 1993, has been disclaimed.

Int. Cl.[2] **C08L** *3/00, 63/00*

U.S. Cl. 260—29.2 EP **8 Claims**

1. An aqueous epoxy resin paint composition which comprises an epoxy resin emulsion formed by emulsifying a bisphenol type epoxy resin in water with a polyoxyethylene benzylated phenyl ether having an HLB value of at least 15, and a polyamide resin curing agent is derived from a dimer acid and a polyether diamine incorporated in said epoxy resin emulsion.

4,104,224

PROCESS FOR PREPARING WATER-DILUTABLE, HEAT-CURING EPOXY RESIN COATING COMPOSITIONS USING ORGANIC COSOLVENTS

Robert C. Nelson, Central Valley, N.Y.; John Allister Gannon, Danbury, Conn., and Kwan Ting Shen, Lakewood, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,871

Int. Cl.[2] **C08L** *61/24, 61/28*

U.S. Cl. 260—29.4 R **44 Claims**

1. An improved process for preparing a water-dilutable, heat-curable coating composition which comprises

(a) a hydroxy-containing adduct formed by reacting an aromatic polyglycidyl ether having a molecular weight in the range of 360 to 500 with a polyethylene glycol having an average molecular weight in the range of 400 to 800 in the presence of 10 to 30% by weight of a polyhydric phenol, wherein the moles of aromatic polyglycidyl ether to combined moles of polyethylene glycol plus polyhydric phenol are in the ratio of 1.0/1.0 to 2.0/1.0, and wherein the moles of polyethylene glycol to moles of polyhydric phenol are in the ratio of 1.0/1.5 to 1.0/9.0,

(b) 5 to 50% by weight of solids of an aminoplast or phenoplast curing agent, and

(c) sufficient water to bring the total percent solids in the range of 10 to 65% by weight,

wherein the improvement comprises

adding to the hydroxy-containing adduct (a) either before or after addition of the curing agent (b) from 5 to 50% by weight based on the adduct (a) of an organic solvent selected from the group consisting of tetrahydrofuran, 1,2-dimethoxyethane, 1,2-diethoxyethane, diethylene glycol dimethyl ether, diethylene glycol diethyl ether, an alkanol of 1 to 4 carbon atoms, ethylene glycol, propylene glycol, tetrahydrofurfuryl alcohol, a dialkyl ketone of 3 to 7 carbon atoms, a 2-alkoxyethanol of 1 to 4 carbon atoms in the alkoxy group, an alkoxydiethylene glycol of 1 to 4 carbon atoms in the alkoxy group, diethylene glycol, triethylene glycol, and a lower alkyl acetate, or a mixture thereof before dilution with water (c) to give a stable, aqueous organic composition which contains no particles larger in size than 0.1 micron or which is a fine particle emulsion with particles up to 5 microns in size, and

with the proviso that the weight ratio of organic solvent to water cannot exceed 1 to 3.

4,104,225

METHOD OF MAKING A COATING COMPOSITION CONTAINING A FLUOROCARBON POLYMER RESIN AND AN ALUMINUM CONTAINING BINDER

John P. Conbere, Holmdel, N.J., assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 459,700, Apr. 10, 1974, abandoned, which is a continuation of Ser. No. 207,644, Dec. 13, 1971, abandoned. This application Dec. 23, 1975, Ser. No. 643,868

Claims priority, application United Kingdom, Nov. 26, 1971, 54948/71

Int. Cl.[2] **C08L** *27/18*

U.S. Cl. 260—29.6 F **16 Claims**

1. A method of making a coating composition which consists essentially of an aqueous dispersion containing a fluorocarbon polymer resin and, as binder, an aqueous solution identifiable as equivalent to a solution of an aluminum phosphate in a mineral acid, wherein the binder is prepared by mixing an aluminum hydroxychloride with an acid selected from the group consisting of phosphoric acids and mixtures of at least one phosphoric acid with at least one mineral acid selected from the group consisting of hydrochloric acid, sulphuric acid and nitric acid, and dispersing the fluorocarbon polymer resin in the aqueous binder solution, the weight of fluorocarbon polymer resin in the coating composition being from 1% to 60% by weight based on the weight of the composition, the amount of the binder in the composition being such that the weight of aluminum divided by the weight of the fluorocarbon polymer resin is from 0.02 to 0.25, the ratio of the number of aluminum atoms to the number of mineral acid molecules, whether added as mineral acid or derived from the aluminum hydroxychloride by reaction with the phosphoric acid or both, being from 1:0.1 to 1:5 and the ratio of the number of aluminum atoms to the number of atoms of phosphorus being $1:x$ where x is up to 2.

4,104,226

RETENTION AIDS AND FLOCCULANTS BASED ON POLYACRYLAMIDES

Jaroslav Melzer, Ludwigshafen, and Hans-Uwe Schenck, Frankenthal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 21, 1976, Ser. No. 707,432

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1975, 2538281

Int. Cl.[2] **C08L** *39/04*

U.S. Cl. 260—29.6 WB **6 Claims**

1. A mixed polyacrylamide composition with improved retention aid and flocculant properties, said composition consisting essentially of a mixture of cationic and anionic polyacrylamides in the form of a water-in-oil polymer dispersion containing, in the inner phase, 99.99 to 95% by weight of one of said polyacrylamides and from 0.01 to 5% by weight of the other of said polyacrylamides, said percentages of cationic and anionic polyacrylamides adding up to 100, the cationic polyacrylamide being a copolymer of acrylamide containing from 10 to 90% by weight of a comonomer selected from the group consisting of esters of amino alcohols and C_{3-5} ethylenically unsaturated carboxylic acids, amides of said carboxylic acids derived from diamines, N-vinylimidazoles and vinylpyridine,

said comonomers being in neutralized or quaternized form, and the anionic polyacrylamide being a copolymer of acrylamide with from 10 to 90% by weight of at least one C_{3-5} ethylenically unsaturated carboxylic acid.

4,104,227

FILM FORMING AQUEOUS SYNTHETIC RESIN DISPERSIONS AND PAINTS PREPARED THEREFROM

Hanns Boessler, Darmstadt; Wilhelm Elser, Graefenhausen; Klaus Huebner, Ober Ramstadt-Eiche, and Hans Ottofrickenstein, Darmstadt-Eberstadt, all of Fed. Rep. of Germany, assignors to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Oct. 18, 1976, Ser. No. 733,325

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1975, 2547970

Int. Cl.[2] C08F *26/06*

U.S. Cl. 260—29.6 HN **4 Claims**

1. An aqueous film-forming dispersion of a synthetic resin, said dispersion being capable of forming a film having a dynamic freezing temperature between 0°, and 90° C. and comprising a continuous aqueous phase; at least 0.1 percent, by weight of the dispersion, of an emulsifier; and a polymer phase, dispersed in said aqueous phase, said polymer phase comprising particles of an average particle size between 0.05 and 2 microns of a copolymer comprising from 0.5 to 5 percent by weight of units of an imidazole comonomer of the formula

wherein R′ is hydrogen or alkyl having 1 to 4 carbon atoms and R is an aliphatic group having a polymerizable carbon-carbon double bond therein, and more than 80 percent by weight of an alkyl ester of acrylic acid or methacrylic acid having 1 to 8 carbon atoms in the alkyl group thereof or of styrene or a vinyl ester of an saturated carboxylic acid having 2 to 4 carbon atoms.

4,104,228

LINEAR, PARTIALLY DEACYLATED POLY(N-ACYL)ALKYLENIMINES AS TANNIN MIGRATION INHIBITORS

Victor E. Meyer, and Kenneth M. Kem, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 27, 1976, Ser. No. 754,398

Int. Cl.[2] C08L *79/00*

U.S. Cl. 260—29.6 NR **12 Claims**

1. A method of inhibiting tannin migration through a latex paint applied to a tannin-containing wood surface, the method comprising applying to the wood surface a latex paint blended with an inhibiting amount of a linear, water-soluble, partially deacylated poly(N-acyl)alkylenimine having a weight average molecular weight of at least about 10,000.

4,104,229

PIGMENTED LATEX PAINTS HAVING SUPERIOR GLOSS PREPARED BY GRINDING A PIGMENT INTO A SOLUTION OF A COPOLYMER OF AN UNSATURATED CARBOXYLIC ACID

Kazys Sekmakas, Chicago, and Kenneth K. Hesler, West Chicago, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

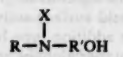
Continuation of Ser. No. 589,876, Jun. 24, 1975, Pat. No. 4,058,499. This application Feb. 10, 1977, Ser. No. 767,327

The portion of the term of this patent subsequent to Nov. 15, 1994, has been disclaimed.

Int. Cl.[2] C08L *33/02*

U.S. Cl. 260—29.6 RW **9 Claims**

1. A method of producing a high gloss finish employing a water base, pigmented, latex paint which is air dried comprising, grinding a pigment into a water-free solution of an at least partially neutralized carboxyl-functional addition copolymer of monoethylenically unsaturated monomers including at least about 3% by weight of monoethylenically unsaturated carboxylic acid in water miscible organic solvent, the major proportion of said pigment being titanium dioxide, and the pigment volume concentration being at least 10%, said copolymer being at least partially neutralized with an hydroxy amine having the formula:



in which R is hydrogen or an alkyl group, R′ is an alkylene group, and X is either R or R′OH, to render the said copolymer dispersible in water, and thereby form a nonaqueous pigment paste, mixing the nonaqueous pigment paste with an air drying aqueous latex consisting essentially of emulsified aqueous emulsion copolymer particles having a T_g below 20° C., applying the resulting latex paint to a substrate and air drying the paint.

4,104,230

TWO-PACKAGE POLYMERIC COMPOSITIONS

Wen-Hsuan Chang, Gibsonia; Karl F. Schimmel, Verona, and James A. Claar, Export, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 23, 1977, Ser. No. 771,135

Int. Cl.[2] C08L *33/02, 63/10*

U.S. Cl. 260—29.6 NR **13 Claims**

1. A two-package polymeric composition, the film-forming vehicle components of which consists essentially of:

(a) a polyepoxide having a 1,2-epoxy equivalent of greater than 1.0 and a molecular weight below about 4,000; and

(b) an addition interpolymer formed from at least one polymerizable ethylenically unsaturated carboxylic acid monomer with one or more other polymerizable ethylenically unsaturated monomers wherein the unsaturated carboxylic acid monomer comprises about 5 percent to about 60 percent of the addition interpolymer, and pendent thereto:

(1) anionic salt groups formed by reacting said carboxyl groups with a sufficient amount of a base to give the interpolymer a pH of greater than about 6 in an aqueous medium; and

(2) amine groups formed by reacting from about 5 mole percent to about 95 mole percent of said carboxyl groups with an alkylenimine;

said components (a) and (b) being interractive to form a cross-linked, hard and solvent- and stain-resistant material.

4,104,231

POLYCARBONATE COMPOSITIONS CONTAINING IMINATED AND THIONATED CARBONATE PLASTICIZERS

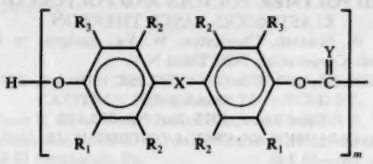
Victor Mark, Evansville, Ind., and Phillip Steven Wilson, Louisville, Ky., assignors to General Electric Company, Pittsfield, Mass.

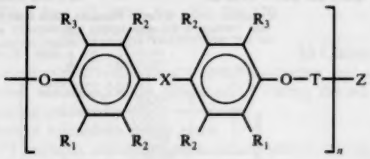
Filed Dec. 8, 1976, Ser. No. 748,468

Int. Cl.[2] C08K *5/36, 5/29*

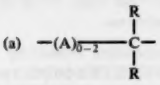
U.S. Cl. 260—30.8 R **7 Claims**

1. A plasticized polycarbonate composition comprising in admixture a high molecular weight aromatic carbonate polymer and a minor amount of an oligomeric-polymeric plasticizer of the following formula:

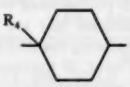




wherein R_1 is independently selected from the group consisting of hydrogen, halogen or C_1 to C_{12} alkyl; R_2 is independently selected from the group consisting of hydrogen of C_1 to C_5 alkyl; R_3 is independently selected from the group consisting of hydrogen, halogen or C_1–C_2 alkyl; X is selected from the group consisting of:



wherein A is

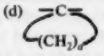


and R_4 is hydrogen of C_1–C_4 alkyl; R is independently selected from the group consisting of hydrogen, C_1–C_{15} alkyl; aryl of 6–14 carbon atoms and substituted aryl wherein the substituents are C_1–C_5 alkyl;

(b) $-CH_2CH_2-$

(c) $-CH_2B\text{-}CH_2-$

wherein B is C_1–C_{16} alkylene or arylene of 6 to 14 carbon atoms;

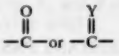


wherein *a* is an integer of 3 to 15;

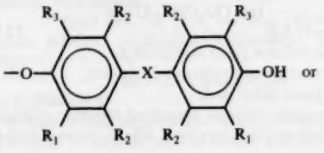
(e) —O—

(f) —S—

Y is =S or =N—R_5, wherein R_5 is C_1–C_{30} alkyl; aryl of 6 to 12 carbon atoms or substituted aryl wherein the substituents C_1–C_{15} alkyl or halogen; T is



wherein Y is as previously defined; *m* and *n* are integers from 0 to 80 provided the sum of *m* and *n* is at least 2; and Z is



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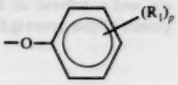


wherein R_1, R_2, R_3 and X are as previously defined and *p* is an integer of 0–5.

4,104,232

HALOGEN-CONTAINING RESIN COMPOSITION

Takeo Inagaki, Yachiyo; Hideki Nakagawa, Tokyo, and Hiroshi Isa, Yachiyo, all of Japan, assignors to Lion, Fat & Oil Company, Ltd., Tokyo, Japan

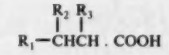
Filed Jul. 12, 1976, Ser. No. 704,657

Claims priority, application Japan, Jul. 18, 1975, 50-87954

Int. Cl.[2] C08K *5/10*

U.S. Cl. 260—31.6 **6 Claims**

1. A halogen-containing resin composition comprising a halogen-containing resin having incorporated therein one or more esters which lubricate and heat stablize said resin, said esters being derived from one or more fatty acids and one or more polyhydric alcohols selected from the group consisting of ethylene glycol, propylene glycol, 1,3-butanediol, 1,4-butanediol, glycerol, trimethylolethane, and pentaerythritol, said fatty acids being expressed by the general formula



where at least two of the R_1, R_2 and R_3 radicals are alkyl radicals and, when two of them are alkyl radicals, the remaining one is hydrogen; and the total number of carbon atoms contained in the R_1, R_2 and R_3 radicals is in the range of from 18 to 38.

4,104,233

ω-BROMOALKYL PLASTICIZER COMPOSITIONS

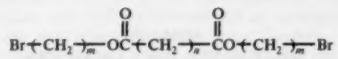
Thomas C. Mathis, St. Louis, Mo.; Albert W. Morgan, Collinsville, Ill., and William Vanderlinde, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 642,965, Dec. 22, 1975, abandoned. This application Aug. 2, 1976, Ser. No. 710,976

Int. Cl.[2] C08K *5/11*

U.S. Cl. 260—31.8 HA **11 Claims**

1. A composition comprising a vinyl halide polymer and an ω-bromoalkyl ester of an aliphatic dicarboxylic acid of the formula



wherein *m* represents an integer from 1 to 8 and *n* represents an integer from 4 to 6.

4,104,234

NOVEL BIOLOGICALLY ACTIVE COPOLYMERS

John R. Bednarski, Jackson Heights, N.Y., and David B. Russell, Westfield, N.J., assignors to M&T Chemicals Inc., Stamford, Conn.

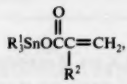
Division of Ser. No. 738,001, Nov. 2, 1976. This application Jun. 13, 1977, Ser. No. 805,837

Int. Cl.[2] C08K *5/01*

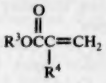
U.S. Cl. 260—33.6 UA **7 Claims**

1. In an improved coating composition for controlling the attachment and growth of fouling organisms, said composition comprising a liquid diluent and, as a film-forming component of said coating composition, from 1 to 50%, based on the weight of said composition, of a biologically active copolymer

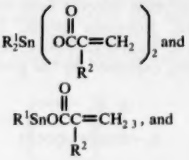
obtained by reacting in the presence of a polymerization initiator and a solvent at least one solubilized triorganotin compound of the general formula



wherein said organotin compound constitutes from 10 to 90 mole % of the total monomers, with at least one solubilized copolymerizable monomer of the general formula



and from 0.01 to 10%, based on the total monomer weight, of a crosslinking agent selected from the group consisting of divinyl benzene, compounds of the formulae



esters of acrylic or methacrylic acid with polyfunctional alcohols and phenols, wherein said esters contain from 2 to 4 residues of said acid, each R^1 is individually selected from the group consisting of alkyl radicals containing from 1 to 8 carbon atoms, cycloalkyl and aryl radicals, R^2 and R^4 are individually selected from hydrogen and methyl radicals and R^3 represents an alkyl radical containing from 1 to 18 carbon atoms, a cyclohexyl or a phenyl radical, the improvement which resides in reacting said triorganotin compound, copolymerizable monomer and crosslinking agent in the presence of at least one liquid aliphatic or cycloaliphatic hydrocarbon containing from 7 to 14 carbon atoms as the solvent for the reactants.

4,104,235

SOLDERABLE WIRE LACQUERS

Klaus Ohm, Nettetal-Lobberich, Fed. Rep. of Germany, assignor to Chemische Fabrik Dr. Wiedeking, Kempen, Fed. Rep. of Germany

Filed Oct. 13, 1976, Ser. No. 731,925

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1975, 2545912

Int. Cl.[2] C08K *5/06*

U.S. Cl. 260—33.2 R **1 Claim**

1. In a wire lacquer permitting tinning and soldering of a wire coated therewith, the lacquer consisting essentially of a polyester of isophthalic or terephthalic acid having a hydroxyl number of 150 to 450, an isocyanate having masked isocyanato groups, and a solvent dissolving said polyester and said isocyanate, the improvement which includes:

(a) said isocyanate being masked by ϵ-caprolactam; and

(b) said solvent consisting essentially of at least one member of the group consisting of diglycol monomethyl ether or diglycol monoethyl ether.

4,104,236

LIQUID POLYMER/POLYOLS AND POLYURETHANE ELASTOMERS BASED THEREON

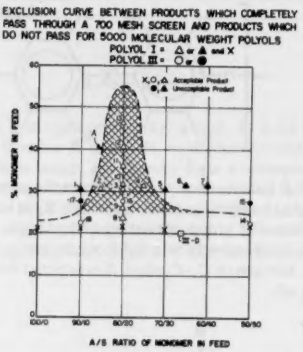
Donald W. Simroth, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 501,362, filed Aug. 28, 1974, abandoned

Filed Jul. 3, 1975, Ser. No. 593,164

Int. Cl.[2] C08K *5/06*; C09K *3/00*; C08G *18/14, 18/62*

U.S. Cl. 260—33.2 R **10 Claims**


EXCLUSION CURVE BETWEEN PRODUCTS WHICH COMPLETELY PASS THROUGH A 700 MESH SCREEN AND PRODUCTS WHICH DO NOT PASS FOR 5000 MOLECULAR WEIGHT POLYOLS
POLYOL I = Δ or ▲ and X
POLYOL III = O or ●
X,O,Δ Acceptable Product
●,▲ Unacceptable Product
% MONOMER IN FEED
A/S RATIO OF MONOMER IN FEED

1. A liquid polymer/polyol composition consisting essentially of: (1) from 45 to less than 80 wt.% of a polyoxypropylene polyol having a molecular weight of at least 2000 and (2) from 55 to over 20 wt.% of an acrylonitrile-styrene polymer consisting essentially of: (a) from 60 to 90 wt.% polymerized acrylonitrile and (b) from 40 to 10 wt.% polymerized styrene, said polymer being in the form of particles that are stably dispersed in the polyol, said composition being essentially free of polymer particles having diameters over 30 microns, said composition having been produced by polymerizing a monomer mixture of acrylonitrile and styrene in the polyol, said composition having (i) a wt.% of the monomer mixture, based on the sum of the weights of the monomer mixture and the polyol used to produce the composition, and (ii) a weight ratio of acrylonitrile to styrene in the monomer mixture such that a plot of (i) versus (ii) falls in area A of FIG. 4 when the polyol has a molecular weight of about 5,000, in area B of FIG. 8 when the polyol has a molecular weight of about 3,000 or in area C of FIG. 9 when the polyol has a molecular weight of about 2,000 and said composition being a composition other than: (A) a composition produced from 60 wt.% of a polyol having a molecular weight of about 4000 produced by the addition of 87 parts by weight of propylene oxide and 13 parts by weight of ethylene oxide to propylene glycol and 40 wt.% of a mixture of 80 wt.% acrylonitrile and 20 wt.% styrene; and (B) a composition produced from 70 wt.% of a polyol having a molecular weight of about 4,000 produced by the addition of 87 parts by weight of a propylene oxide and 13 parts by weight of ethylene oxide to propylene glycol and 30 wt.% of a mixture of 80 wt.% of acrylonitrile and 20 wt.% styrene.

4,104,237

ORGANOSILICON SUNLIGHT-RESISTANT PASTES

Louis Linguenheld, Saint Genis-Laval, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Oct. 18, 1976, Ser. No. 733,173

Claims priority, application France, Oct. 21, 1975, 75 32123

Int. Cl.[2] C08L *83/04*

U.S. Cl. 260—37 SB **12 Claims**

1. An organosilicon paste comprising:

(a) an oily diorganopolysiloxane polymer;

(b) an inorganic filler; and,

(c) an ultraviolet radiation absorbing effective organic compound, wherein said inorganic filler is present in the range

of from about 5 to about 30 parts per 100 parts of said polymer.

4,104,238

SILICA-ALUMINA TRIHYDRATE FILLED EPOXY CASTINGS RESISTANT TO ARCED SF_6

Terrence E. Chenoweth, Monroeville, and Frederick A. Yeoman, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 23, 1976, Ser. No. 744,379

Int. Cl.[2] C08L *63/00*

U.S. Cl. 260—37 EP **10 Claims**

1. An electrical article comprising a metal conductor and a container, cured, insulating body produced by curing the admixture consisting essentially of:

(A) 100 parts of hydantoin epoxy resin;

(B) about 75 parts to about 110 parts of anhydride curing agent;

(C) about 0.04 part to about 1.5 parts of a cure promoter;

(D) about 100 parts to about 450 parts of fused silica; and

(E) about 75 parts to about 275 parts of alumina trihydrate; wherein the weight ratio of fused silica:alumina trihydrate is between about 0.75:1 to about 3.5:1; said cured insulating body characterized by being resistant to arced SF_6 gas and having a coefficient of linear thermal expansion of up to about 38×10^{-6} in./in./° C.

4,104,239

ORGANOPOLYSILOXANE COMPOSITIONS TRANSFORMABLE INTO ELASTOMERS WITHOUT USE OF VULCANIZING AGENTS

Michel Bargain, Lyon, and Robert Lagarde, Feyzin, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Mar. 4, 1977, Ser. No. 774,485

Claims priority, application France, Mar. 5, 1976, 76 07043

Int. Cl.[2] C08L *83/04*

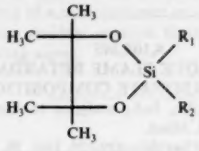
U.S. Cl. 260—37 SB **14 Claims**

1. A storage stable organopolysiloxane composition devoid of a curing agent which is heat curable into elastomers comprising:

[1] 100 parts by weight of at least one hydroxylated polydiorganosiloxane having a viscosity of between about $2 \cdot 10^5$ and about $80 \cdot 10^6$ cps at 25° C. and containing about 0.001 to about 0.1% by weight of terminal hydroxy groups per weight of the polysiloxane;

[2] at least 10 parts by weight of a silica having a specific surface of between about 100 and about 400 m^2/g; and,

[3] 0.5 to 15 parts by weight of at least one silane of the formula (I)



(I)

wherein R_1 and R_2 are the same or different and represent methyl or ethyl.

4,104,240

HIGH SOLIDS PIGMENT COATING COMPOSITION

Roelof Buter, Dieren, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed Dec. 10, 1976, Ser. No. 749,698

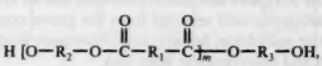
Claims priority, application Netherlands, Dec. 15, 1975, 7514566

Int. Cl.[2] C08G *37/30*

U.S. Cl. 260—39 P **9 Claims**

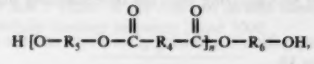
1. A high solids pigmented coating composition prepared from a blend of an ester diol as binder and a curing agent for the binder, characterized in that (1) the ester diol is a mixture of

(a) 20-80 mole % of an ester diol having the general formula:



where R_1 represents the group formed by abstraction of the carboxyl groups from a cycloaliphatic and/or aromatic dicarboxylic acid having 8 to 20 carbon atoms and R_2 and R_3 may be the same or different and represent groups formed by abstraction of the two hydroxyl groups from a divalent alcohol having 2 to 12 carbon atoms, and m is a number of 1-3, and

(b) 80-20 mole % of an ester diol having the general formula:



where R_4 represents the group formed by abstraction of the two carboxyl groups from an aliphatic dicarboxylic acid having 2 to 12 carbon atoms, and R_5 and R_6 may be the same or different and represent groups formed by abstraction of the two hydroxyl groups from a divalent alcohol having 2 to 12 carbon atoms, and n is a number of 1-3,

(2) the curing agent for the binder is an aminoplast, and

(3) the amount of pigment in said coating composition is at least 30% by weight, based on the total solids content.

4,104,241

THERMOSETTING ADDITIVES FOR POLYESTER-BASED MOLDING COMPOUNDS

Michael G. Roberts, Heath; Carl R. Strauss, and Charles E. Bolen, both of Newark, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 517,695, Oct. 24, 1974, abandoned. This application Oct. 17, 1975, Ser. No. 623,285

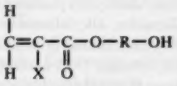
Int. Cl.[2] C08K *7/14*; C08L *67/06*

U.S. Cl. 260—40 R **18 Claims**

1. A method of improving the surface characteristics of a molded composition produced from a molding composition comprising a thermosetting unsaturated polyester resin, said method comprising incorporating into said polyester resin a resin comprising the adduct of:

1. a polymer formed from a liquid monomer selected from the group consisting of styrene, substituted styrenes, lower alkyl esters of acrylic anc methacrylic acids, cyclic acrylates and diallyl phthalate and an unsaturated dicarboxylic acid selected from the group consisting of maleic anhydride, fumaric acid, citraconic acid, chloromaleic acid and itaconic acid; and,

2. a hydroxy-alkyl unsaturated monomer having the formula



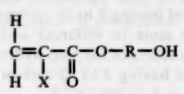
wherein X is hydrogen or methyl and R is an alkyl group containing from 1 to 10 carbon atoms, said adduct containing functional carboxylic acid groups, being capable of polymerizing with the thermosetting unsaturated polyester resin and being incorporated in said polyester in an amount sufficient to improve at least one surface characteristic of said molded composition.

10. A composition of matter comprising:

a. a thermosetting unsaturated polyester resin; and,

b. an adduct of:

1. a polymer formed from a liquid monomer selected from the group consisting of styrene, substituted styrenes, lower alkyl esters of acrylic and methacrylic acids, cyclic acrylates and diallyl phthalate and an unsaturated dicarboxylic acid selected from the group consisting of maleic anhydride, fumaric acid, citraconic acid, itaconic acid and chloromaleic acid; and,
2. a hydroxy-alkyl unsaturated monomer having the formula



wherein X is hydrogen or methyl and R is an alkyl group containing from 1 to 10 carbon atoms and wherein said adduct is capable of polymerizing with the thermosetting unsaturated polyester.

18. A composition comprising glass fibers and the composition of claim **10**.

4,104,242

REINFORCED THERMOPLASTIC POLYESTER COMPOSITIONS HAVING IMPROVED HIGH VOLTAGE BREAKDOWN RESISTANCE

John Edward Kochanowski, Stockbridge, Mass., and Allen Dale Wambach, Evansville, Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 16, 1976, Ser. No. 751,186
Int. Cl.² C08K *5/25*
U.S. Cl. 260—40 R **17 Claims**

1. A reinforced thermoplastic composition having improved dielectric resistance comprising:

(a) a high molecular weight linear polyester resin;
(b) a reinforcing amount of a reinforcing agent; and
(c) a minor amount of an alkylhydroxyphenylalkanoylhydrazine.

4,104,243

METHOD OF PREPARING LOW VISCOSITY/INORGANIC FILLER

Edward G. Howard, Jr., Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 424,819, Dec. 14, 1973, abandoned. This application Jun. 2, 1975, Ser. No. 582,816
Int. Cl.² B01J *31/02*; C08K *9/10*
U.S. Cl. 260—42.14 **19 Claims**

13. A method of preparing a polyolefin in the presence of a high solids dispersion of finely divided inorganic filler compound in a liquid hydrocarbon diluent under los viscosity conditions which comprises

(a) mixing the hydrocarbon diluent with 0.01–2% by weight, based on the inorganic filler compound, of an organoaluminum compound selected from the group consisting of trialkylaluminums, dialkylalkylaluminum hydrides, dialkylaluminum alkoxides, alkylaluminum halides and polymeric hydrocarbylaluminums in which the alkyl groups, alike or different, contain 1–10 carbon atoms,
(b) dispersing at least 9 weight/volume percent of the inorganic filler compound as a slurry in the mixture of hydrocarbon diluent and organoaluminum compound, said dispersion containing a transition metal compound component of a coordination polymerization catalyst system,
(c) adding to the dispersion an olefin selected from the group consisting of 1-alkenes of 2–10 carbon atoms and mixtures thereof with agitation at a temperature from 0° to 250° C and a pressure from atmospheric to 500 atmospheres, and
(d) isolating the product.

4,104,244

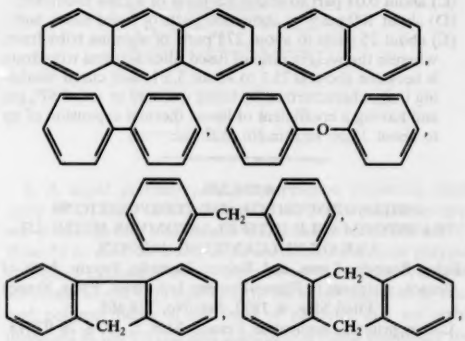
METHOD FOR PROTECTION VINYL POLYMERS FROM THERMO-OXIDATIVE DESTRUCTION

Alexandr Evgenievich Chuchin, Petrovsko-Razumovsky proezd, 20, kv. 52, and Leonid Leonidovich Proskurin, 2 Sinichkina ulitsa, 26, kv. 76, both of Moscow, U.S.S.R.

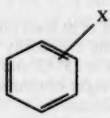
Filed Jan. 22, 1975, Ser. No. 543,048
Int. Cl.² C08K *5/01*
U.S. Cl. 260—45.7 R **10 Claims**

1. A method for stabilizing a vinyl polymer against thermo-oxidative degradation which comprises incorporating into a previously prepared unstabilized vinyl polymer an inhibitor selected from the group consisting of (1) poly(arylene alkylenes) of the formula:

wherein Ar_1 and Ar_2 are



$m + n = 2$ to 30; k is an integer of 1 and 2; and when $k = 1$, Ar_1 and Ar_2 are also



where X is H or a C_1-C_4 alkyl; and (2) hydroperoxides of said poly(arylene alkylenes); said inhibitor being used in an amount within the range of from 0.01 to 10% by weight of the vinyl polymer.

4,104,245

NON-OPAQUE FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 429,120, Dec. 28, 1973, Pat. No. 3,940,366. This application Oct. 29, 1975, Ser. No. 626,936
The portion of the term of this patent subsequent to Feb. 24, 1993, has been disclaimed.
Int. Cl.² C08K *5/42*
U.S. Cl. 260—45.7 S **20 Claims**

1. a non-opaque flame retardant aromatic carbonate polymer composition comprising in admixture an aromatic carbonate polymer and from 0.001 to about 2.0 parts per hundred part of the aromatic carbonate polymer of an additive selected from the group consisting of a metal salt of a monomeric substitued aromatic sulfonic acid and a polymeric substituted aromatic sulfonic acid and/ or mixtures thereof, and wherein said metal salts thereof are selected from the group consisting of the alkali metal salts and the alkali earth metal salts, and mixtures thereof, and said substituent on the metal salts of the substi-

tuted aromatic sulfonic acid is selected from the group consisting of an electron withdrawing radical and mixtures thereof; said aromatic carbonate polymer and additive having a refractive index in the range of 1.54 to 1.65.

4,104,246

NON-OPAQUE FLAME-RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 15, 1976, Ser. No. 733,002
Int. Cl.[2] C08K *5/42*
U.S. Cl. 260—45.7 S **14 Claims**

1. In a flame-retardant aromatic carbonate polymer composition comprising in admixture an aromatic carbonate polymer and an additive selected from the group consisting of the metal salts of substituted and unsubstituted sulfonic acids of aromatic ketones and mixtures thereof, wherein said metal salts are selected from the group consisting of alkali metals and alkaline earth metals, and mixtures of these metal salts, and said substituent on the metal salt of the substituted sulfonic acids of aromatic ketones is selected from the group consisting of electron withdrawing radicals and mixtures of electron withdrawing radicals; the improvement comprising including said additive in said admixture in an amount of from 0.001 to about 2.0 parts per hundred parts of the aromatic carbonate polymer, said aromatic carbonate polymer and said additive each having a refractive index in the range of 1.54 to 1.65 such that said composition is non-opaque.

4,104,247

METHOD FOR STABILIZING AN OLEFIN POLYMER

Koich Kato, and Saburo Murata, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1977, Ser. No. 785,152
Claims priority, application Japan, Apr. 6, 1976, 51-38464; Jun. 10, 1976, 51-68123; Jun. 10, 1976, 51-68124
Int. Cl.[2] C08F *6/00;* C08J *3/20;* C08K *5/56*
U.S. Cl. 260—45.7 R **15 Claims**

1. A method for stabilizing a polymer selected from the group consisting of a homopolymer or a copolymer of propylene produced by olefin polymerization using a Ziegler type catalyst which comprises treating a polymer selected from the group consisting of a homopolymer or a copolymer of propylene, containing residual catalyst therein, with an aluminic ester as a treating agent.

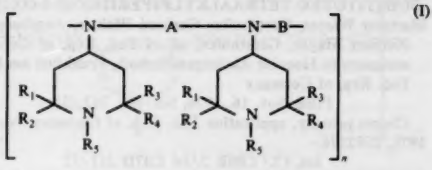
4,104,248

POLYOLEFINE-BASED POLYMERIC COMPOSITIONS STABILIZED BY ORGANIC POLYAMINES, TEXTILE FIBERS OBTAINED THEREFROM, AND NOVEL ORGANIC POLYAMINES

Giuseppe Cantatore, Collescipoli (Terni), Italy, assignor to Montefibre S.p.A., Milan, Italy

Filed Mar. 17, 1976, Ser. No. 667,657
Claims priority, application Italy, Mar. 21, 1975, 21490 A/75; Mar. 21, 1975, 21491 A/75
Int. Cl.[2] C08K *5/34*
U.S. Cl. 260—45.8 N **12 Claims**

1. A stabilized polyolefine-based polymeric composition characterized in that it contains as stabilizer and a stabilizing amount of an organic polyamine having the following general formula:



(I)

wherein

R_1, R_2, R_3 and R_4 are equal to or different from each other and are an alkyl group having from 1 to 4 carbon atoms;

R_5 is hydrogen or an alkyl group having from 1 to 4 carbon atoms;

A is an alkylene group having from 2 to 10 carbon atoms;

B is a divalent aliphatic cycloaliphatic, aromatic or alkylaromatic radical, which can contain hetero atoms such as O, S, N and P either in the chain or as side substituents; and

n is a whole number between 2 and 1000.

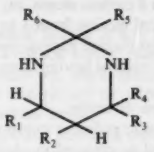
4,104,249

HEXAHYDROPYRIMIDINES AS ANTI-OXIDANTS IN NATURAL AND SYNTHETIC RUBBERS

Bernardus A. Oude Alink, St. Louis, and Neil E. S. Thompson, Creve Coeur, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Jun. 1, 1976, Ser. No. 691,530
Int. Cl.[2] C08K *5/34;* C07D *239/02, 239/06, 239/70*
U.S. Cl. 260—45.8 N **14 Claims**

1. A rubber composition containing an antioxidant amount of a hexahydropyrimidine of the formula



where the R's are hydrogen, alkyl, aryl, cycloalkyl, aralkyl, alkaryl or heterocyclic, and where R_1 and R_2 may be joined to form a cycloalkyl group, R_3 and R_4 may be joined to form a cycloalkyl group and R_5 and R_6 may be joined to form a cycloalkyl group.

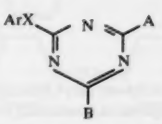
4,104,250

FLAME-RETARDANT POLYMERS WITH 1,3,5-TRIAZINES HAVING HALO- AND HALO-ARYL SUBSTITUTENTS

Nicodemus E. Boyer, Redwood City, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 11, 1976, Ser. No. 713,466
Int. Cl.[2] C08K *5/34, 5/36;* C07D *251/52*
U.S. Cl. 260—45.8 NT **8 Claims**

1. A flame-retardant polymeric composition comprising in combination a normally flammable polymer and a substituted triazine having the structural formula



where Ar is haloaryl, X is sulfur or imino, A is halogen, and B is ArX or halogen.

4,104,251
SUBSTITUTED TETRAALKYLPIPERIDONE-4-OXIMES

Hartmut Wiezer, Gersthofen; Gerhard Pfahler, Augsburg, and Norbert Mayer, Gersthofen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

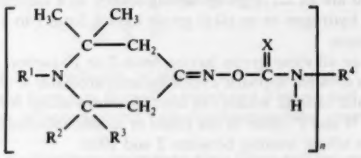
Filed Nov. 16, 1976, Ser. No. 742,233

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1975, 2552176

Int. Cl.[2] C08K *5/34;* **C07D** *211/72*

U.S. Cl. 260—45.8 N **6 Claims**

1. A compound of the formula



in which

n is 1 or 2,

R^1 represents hydrogen or oxygen or a hydroxyl group,

R^2 and R^3 represent identical or different linear or branched, but not in alpha-position, alkyl radicals having from 1 to 9 carbon atoms or R^2 and R^3 form a cycloalkyl ring having 5 to 7 carbon atoms inclusive of the carbon atom of the hetero ring,

R^4 represents, when *n* is equal to 1, a linear, cyclic or branched alkyl radical having from 1 to 18 carbon atoms or a phenyl- or naphthyl radical unsubstituted or substituted by a halogen atom or an alkyl or alkoxy radical each having from 1 to 4 carbon atoms, or, when *n* is equal to 2, an alkylene radical having from 1 to 6 carbon atoms or a phenylene or naphthalene radical unsubstituted or substituted by an alkyl radical having from 1 to 4 carbon atoms, and

X stands for oxygen or sulfur.

6. Stabilized synthetic polymer compositions containing as stabilizer a compound as claimed in claim **1** in an amount of from 0.01 to 5% by weight calculated on the polymer.

4,104,252
OLEFIN POLYMER STABILIZER

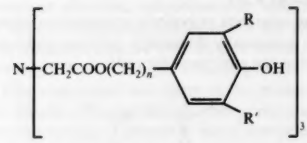
Ingenuin Hechenbleikner, West Cornwall, and William Palmer Enlow, Falls Village, both of Conn., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 26, 1977, Ser. No. 836,282

Int. Cl.[2] C08K *5/17;* **C07C** *101/20*

U.S. Cl. 260—45.8 R **9 Claims**

1. A substituted nitriloacetate having the structure



wherein R and R' are lower alkyl radicals and *n* is 1–4.

3. A polymer composition containing a major proportion of an olefin polymer and a minor proportion, sufficient to provide heat and light stability, of the substituted nitriloacetate of claim **1**.

4,104,253
FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 15, 1976, Ser. No. 733,017

Int. Cl.[2] C08K *5/42*

U.S. Cl. 260—45.8 RW **10 Claims**

1. An improved flame retardant polycarbonate composition of a aromatic carbonate polymer in admixture with 0.01 to about 5.0 parts per hundred parts of the aromatic carbonate polymer of an additive selected from the group consisting of organic alkali metal salts, organic alkaline earth metal salts, and mixtures thereof, the improvement which comprises having, in admixture with the flame retardant aromatic carbonate polymer, 0.01 to about 5.0 parts per hundred parts of the aromatic carbonate polymer of an additive selected from the group consisting of halogenated organic alkali metal salts, halogenated organic alkaline earth metal salts of aromatic sulfonic acids, or mixtures thereof.

4,104,254
METHOD FOR STABILIZATION OF UV SENSITIVE PLASTICS WITH SUBSTITUTED 1,3-OXAZOLIDINE

John Ta-Yuan Lai, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

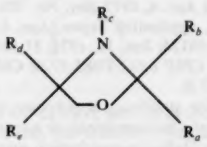
Filed Dec. 2, 1977, Ser. No. 856,876

Int. Cl.[2] C08K *5/35*

U.S. Cl. 260—45.8 NZ **3 Claims**

1. A method for extending the useful life of polymers which are sensitive to photodegradation by ultraviolet light, said method comprising:

incorporating within said ultraviolet light sensitive polymer a UV stabilizer effective amount of at least one compound of the formula



wherein R_a, R_b, R_d and R_e are independently selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms, cycloalkyl, and aryl; and R_c is hydrogen or hydroxyalkyl.

4,104,255
THIOETHER BIS PHENOLIC ANTIOXIDANTS

John C. Wollensak; Kju Hi Shin, both of Bloomfield Hills; Kryn G. Ihrman, Farmington, all of Mich., and Paul G. Elsey, Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed May 2, 1977, Ser. No. 792,645

Int. Cl.[2] C08K *5/36;* **C07C** *149/00*

U.S. Cl. 260—45.95 C **3 Claims**

1. An antioxidant compound namely di-(3,5-dicyclopentyl-4-hydroxybenzyl)sulfide.

2. A polyolefin normally subject to gradual degradation due to oxidation containing an antioxidant amount of the antioxidant compound of claim **1**.

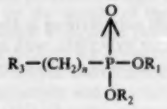
4,104,256

LOW PRESSURE ETHYLENE POLYMER BASED COMPOSITIONS

Mats-Olov Hedblom, Stenungsund, and Sven Gilbert Sultan, Billingsfors, both of Sweden, assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 21, 1975, Ser. No. 569,666
Claims priority, application Sweden, Apr. 19, 1974, 7405343
Int. Cl.[2] C08K 5/53
U.S. Cl. 260—45.95 D 17 Claims

1. An ethylene polymer based composition comprising
ehtylene polymer prepared by chromium containing catalyst having a melt index of less than 1.0 gram per 10 minutes, and a terminal vinyl group content of approximately one vinyl group per polymer molecule, and
melt viscosity stabilizing amounts of at least one phosphonic acid compound which is an alkyl phosphonic acid or a monoalkyester thereof and having the structure



wherein n is a whole number of 1 to 10, and each of R_1, R_2 and R_3 is selected from the group consisting of H, C_1 to C_{30} alkyl groups and an aryl or benzyl group substituted with one OH group and one or two C_1 to C_6 alkyl groups, with the proviso that at least one of R_1 and R_2 is H.

4,104,257

PROCESS FOR PREPARING HIGH MOLECULAR WEIGHT POLYETHER RESINS FROM BISPHENOLS AND EPOXY RESINS

James Albert Clarke, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 27, 1977, Ser. No. 819,321
Int. Cl.[2] C08G 59/62, 59/00
U.S. Cl. 528—102 6 Claims

1. In a process for preparing high molecular weight polyhydroxyether resins by reacting in the presence of a suitable quantity of a suitable solvent or reaction medium, (A) an epoxy resin which is a glycidyl ether of a bisphenol with (B) a bisphenol in the presence of (C) a catalytic quantity of a suitable catalyst; the improvement which comprises adding, after the reaction between Components (A) and (B) is at least about 97% complete based upon the phenolic hydroxyl content, (D) from about 0.005 to about 0.12 phenolic hydroxyl equivalents per total phenolic hydroxyl equivalent contained in Components (B) and (D) of a halogenated bisphenol.

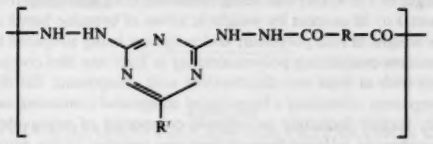
4,104,258

METAL COMPLEX COMPOUNDS OF POLYACYL-2,4-DIHYDRAZINO-5-TRIAZINES

Marija del Rio, Obernburg am Main; Joachim Behnke, Miltenberg; Michael Wallrabenstein, Worth am Main, and Dieter Frank, Elsenfeld, all of Germany, assignors to Akzona Incorporated, Asheville, N.C.

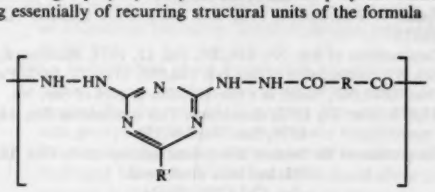
Filed May 20, 1974, Ser. No. 471,505
Claims priority, application Fed. Rep. of Germany, May 24, 1973, 2326472
Int. Cl.[2] C08G 73/08
U.S. Cl. 528—334 10 Claims

1. A metal compound of a fiber-forming polyacyl-2,4-dihydrazino-s-triazine polymer consisting essentially of recurring structural units of the formula



in which:
R is a divalent aromatic radical of 6 to 15 carbon atoms; and
R′ is alkyl of 1 to 4 carbon atoms, phenyl, alkoxy of 1 to 4 carbon atoms, phenoxy, dialkylamino of 2 to 8 carbon atoms, piperidyl, morpholyl or phosphonic acid dialkyl ester of 2 to 8 carbon atoms,
said metal being chemically bound in complex form to at least one of the polymer units in an amount of at least 0.1% by weight with reference to said polymer and said metal being at least one member selected from the class consisting of the metals of Groups IIa, IIIa, IVa, Va, VIa, VIIa, VIII, Ib, IIb, IIIb, IVb and Vb of the long periodic system of elements.

5. A process for the production of a metal-containing and fiber-forming polyacyl-dihydrazino-s-triazine which comprises contacting a polyacyl-dihydrazino-s-triazine polymer consisting essentially of recurring structural units of the formula



in which:
R is a divalent aromatic radical of 6 to 15 carbon atoms; and
R′ is alkyl of 1 to 4 carbon atoms, phenyl, alkoxy of 1 to 4 carbon atoms, phenoxy, dialkylamino of 2 to 8 carbon atoms, piperidyl, morpholyl or phosphonic acid dialkyl ester of 2 to 8 carbon atoms,
said metal being chemically bound in complex form to at least one of the polymer units in an amount of at least 0.1% by weight with reference to said polymer and said metal being at least one member selected from the class consisting of the metals of Groups IIa, IIIa, IVa, Va, VIa, VIIa, VIII, Ib, IIb, IIIb, IVb and Vb of the long periodic system of elements.

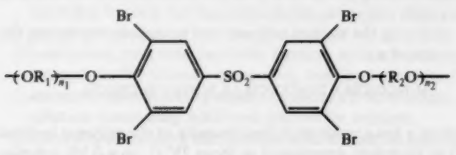
4,104,259

FIREPROOF POLYESTERS FROM BROMINATED DIHYDROXY ALKOXY-DIPHENYL SULFONES

Yasuo Kato, Shiga; Tadashi Ikegami; Junichi Harukawa, both of Otsu, and Katsuhiko Kato, Otsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 503,692, Sep. 6, 1974, abandoned. This application Nov. 18, 1975, Ser. No. 633,091
Claims priority, application Japan, Sep. 7, 1973, 48-101423; Nov. 21, 1973, 48-131427
Int. Cl.[2] C08G 63/68
U.S. Cl. 528—169 11 Claims

1. A fireproof composition comprising a linear aromatic polyester having in its molecular chain a unit of the formula:



wherein R_1 and R_2 are each a straight or branched alkylene

group having 1 to 5 carbom atoms and n_1 and n_2 are each of an integer of 1 to 4, said unit being contained in an amount of from about 3 to 30 percent by weight in terms of bromine based on the weight of said polyester, said polyester being prepared by a process comprising polycondensing at least one diol component with at least one dicarboxylic acid component, the diol component containing a brominated compound containing said unit, further including an organic compound of pentavalent phosphorous selected from at least one member of the group consisting of a phosphoric ester, a phosphonic ester, a phosphinic ester and a high molecular weight phosphorus compound having a degree of polymerization of 5 to 100 and wherein said organic phosphorus compound is incorporated into the polyester in an amount of not more than about 1.0 percent by weight based on the weight of the polyester.

4,104,260

POLY-2-PYRROLIDONE PREPARED WITH INERT DRYING AGENT

Stephen F. Pusztaszeri, P.O. Box 1181, Port Chester, N.Y. 10573

Continuation of Ser. No. 488,298, Jul. 12, 1974, abandoned, which is a continuation of Ser. No. 344,036, Mar. 22, 1973, Pat. No. 3,842,047, which is a continuation-in-part of Ser. No. 237,173, Mar. 22, 1972, abandoned. This application Jan. 14, 1976, Ser. No. 649,159

The portion of the term of this patent subsequent to Oct. 15, 1991, has been disclaimed.

Int. Cl.[2] C08G *69/24*

U.S. Cl. 528—323 **1 Claim**

1. A filament-forming open chain poly (2-pyrrolidone) homopolymer prepared by the process which comprises the steps of:

(a) mixing substantially pure, substantially anhydrous 2-pyrrolidone with a substantially anhydrous alkaline reactant selected from the group consisting of alkali metals and alkali metal hydroxides in a mole ratio of from about 10:1 to 27:1;

(b) heating said mixture under vacuum to a temperature of from 100° to 120° C. to react the alkaline reactant with the 2-pyrrolidone and form a mixture comprising 2-pyrrolidone and the alkali metal salt of 2-pyrrolidone and to distill off the water formed in the reaction mixture;

(c) cooling the reaction mixture to room temperature;

(d) bubbling a dry gas selected from the group consisting of carbon dioxide, nitrogen dioxide and sulfur dioxide through the previously cooled reaction mixture in an amount sufficient to react with substantially all of the metal in the 2-pyrrolidone salt;

(e) mixing the mixture of step (d) with between about 1-5% by weight, based upon the weight of the reaction mixture, of an inert drying agent selected from the group consisting of alkali metal sulfates, bicarbonates and carbonates;

(f) heating to a temperature of about 48° to 52° C. for at least about 40 hours to cause polymerization;

(g) grinding the polymer;

(h) washing the ground polymer with water to neutral pH; and

(i) drying the washed polymer said homopolymer having the structure

$$H_2NCO(CH_2)_3[NHCO(CH_2)_3]_xNHCOCH_2CH_2CH_3$$

where x has a value such that viscosity of the polymer is about 12 to 14 stokes, determined at about 25° C. on a 0.5% solution of the polymer in formic acid.

4,104,261

LOW PILLING POLYESTER FIBERS AND PROCESS FOR THEIR MANUFACTURE

Karl-Heinz Magosch; Roland Feinauer, and Jörn Rüter, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huls, AG, Marl, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 536,988, Dec. 27, 1974, abandoned. This application Jan. 21, 1977, Ser. No. 760,924

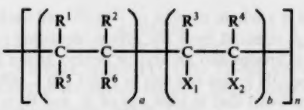
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1974, 2402035

Int. Cl.[2] C08G *63/22*

U.S. Cl. 260—873 **3 Claims**

1. An improvement in the process of melt spinning ethylene terephthalate polyester to produce textile fibers having substantially decreased pilling in fabrics containing the fibers comprising melt polymerizing ethylene terephthalate in the presence of a condensation catalyst to a final temperature of about 250° to 300° C and a final pressure of less than 10 mm of mercury to form an anhydrous melt, the improvement comprising:

conducting said melt polymerizing in the presence of about 0.005 to 2.0 percent by weight, with respect to the dicarboxylic acid component of a substance having the general formula:



where:

n is an integer from 10 to 10,000;

a is zero or an integer from 1 to 100;

b is an integer from 1 to 100;

R^1 through R^6 are hydrogen, an alkyl group with 1 to 3 carbon atoms or an oxalykyl group —OR^7;

R_7 is an alkyl group with 1 to 6 carbon atoms or an aryl group with 6 to 10 carbon atoms;

X_1 is hydrogen, an alkyl group with 1 to 3 carbon atoms, a carboxyl group, or an esterified carboxyl group; and

X_2 is a carboxyl group, a hydroxyl group, an esterified carboxyl group or an esterified hydroxyl group;

building polymerous compounds selected from the group consisting of at least ten carboxyl and hydroxyl groups or at least ten hydroxyl groups as branching components in said polyester; and melt spinning said anhydrous melt.

4,104,262

WATER-DISPERSIBLE ESTER RESIN CONTAINING A MOIETY OF POLYACID OR BIVALENT ALCOHOL CONTAINING A SULFO GROUP

Gerhard Schade, Witten-Bommern, Germany, assignor to Dyanmit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Apr. 8, 1976, Ser. No. 675,083

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1975, 2516305

Int. Cl.[2] C08G *63/12*

U.S. Cl. 528—295 **24 Claims**

1. A water-dispersible polycondensation polyester resin having moieties of at least one dicarboxylic acid and at least one bivalent alcohol having terminal hydroxyl groups, said polyester having a molecular weight between 300 and 3,000, a softening point between 30° and 60° C, a hydroxyl number of at least 35 mg KOH/g, an acid number of less than 5 wherein said polyester additionally contains an amount of 1 to 5 mole percent, based upon the moieties of polycarboxylic acid or bivalent alcohol, moieties of an alkali metal - sulfo group containing polycarboxylic acid or bivalent alcohol.

4,104,263

PROCESS FOR PRODUCING FILM AND FIBER-FORMING POLYALKYLENE TEREPHTHALATE

James F. Kenney, Mendham, N.J., assignor to M&T Chemicals Inc., Stamford, Conn.

Division of Ser. No. 670,654, Mar. 26, 1976.
Filed Jan. 21, 1977, Ser. No. 761,338
Int. Cl.[2] C08G *63/14*
U.S. Cl. 528—279 22 Claims

1. A method for producing high molecular weight, substantially colorless film and fiber-forming polyalkylene terephthalate whereby an alkylene glycol containing from 2 to 10 carbon atoms is reacted under ester interchange conditions with a lower dialkyl terephthalate wherein the alkyl portions of the dialkyl terephthalate each contain from 1 to 4 carbon atoms, and the resultant bis-hydroxyalkyl terephthalate is polycondensed at a temperature from 200 to 300° C. under reduced pressure and with the evolution of free glycol, said method being characterized in that the only catalyst present during the transesterification and polycondensation is from about 0.01 to about 0.3%, based on the weight of the lower dialkyl terephthalate, of a bimetallic compound obtained by reacting 1) a first compound selected from the group consisting of antimony (III) salts of monocarboxylic and dicarboxylic acids, zirconium (IV) salts of monocarboxylic and dicarboxylic acids, antimony (III) and zirconium (IV) alkoxides wherein each alkyl residue of said glycoxides contains from 1 to 12 carbon atoms, and antimony trioxide, 2) a second compound selected from the group consisting of zinc, calcium and manganese salts of monocarboxylic acids and zinc, calcium and manganese salts of dicarboxylic acids, the molar ratio of said first to said second compound being from 1:1 to 1:6, respectively, and 3) at least a stoichiometric amount of a third compound selected from the group consisting of anhydrides of monocarboxylic and dicarboxylic acids, alcohols containing from 1 to 20 carbon atoms and glycols containing from 2 to 20 carbon atoms, wherein the hydrocarbon residue of each of said monocarboxylic acids and dicarboxylic acids contains from 1 to 20 carbon atoms and is present as an aliphatic or aromatic group.

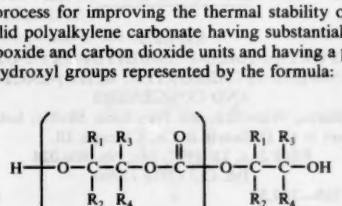
4,104,264

END CAPPED POLYALKYLENE CARBONATES HAVING IMPROVED THERMAL STABLITY

Dale D. Dixon, Kutztown; Michael E. Ford, Trexlertown, and Gerald J. Mantell, Allentown, all of Pa., assignors to Air Products & Chemicals, Inc., Allentown, Pa.

Filed May 5, 1977, Ser. No. 794,263
Int. Cl.[2] C08G *63/62*
U.S. Cl. 528—370 15 Claims

1. A process for improving the thermal stability of a normally solid polyalkylene carbonate having substantially alternating epoxide and carbon dioxide units and having a plurality of free hydroxyl groups represented by the formula:



wherein:

R_1 is hydrogen, a halomethyl group, or a hydrocarbyl group having from 1 to 6 carbon atoms;

R_3 is hydrogen, a halomethyl group, or a hydrocarbyl group having from 1 to 6 carbon atoms;

R_2 and R_4 are hydrogen or a hydrocarbyl group having from 1 to 6 carbon atoms; or

R_1, R_2, R_3 and R_4 are combined together constituting a carbocyclic ring of from 4 to 7 carbon atoms;

which comprises end-capping at least a portion of the free hydroxyl groups of said polyalkylene carbonate by reacting said hydroxyl groups with a hydroxyl reactive sulfur compound having the ability to replace the active hydrogen atom on said hydroxyl group for forming an oxygen-sulfur bond.

4,104,265

VULCANIZATION PROCESS FOR PREPARATION OF POLYURETHANE TIRES

Yves deZarauz, Le Cendre, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Continuation-in-part of Ser. No. 652,122, Jan. 26, 1976, abandoned. This application Feb. 10, 1977, Ser. No. 767,371
Claims priority, application France, Jan. 30, 1975, 75 03001
Int. Cl.[2] C08G *18/62, 18/82*
U.S. Cl. 528—46 11 Claims

1. A process for the manufacture of a vulcanized elastomer which comprises

(1) forming a mix comprising

(a) at least one functional liquid diene prepolymer having reactive mobile hydrogen functions and a degree of functionality of between 1.8 and 2.0;

(b) a reinforcing filler; and

(c) a vulcanizing system comprising sulfur, zinc oxide, and an accelerator having no mobile hydrogen; and adding to the mix

(d) a hydrocarbon chain lengthening bifunctional compound having reactive isocyanate groups and in such amount that the ratio of the number of reactive isocyanate groups of the hydrocarbon chain lengthening bifunctional compound to the number of reactive mobile hydrogen functions of the functional liquid diene prepolymer in the resultant mix is equal to one;

(2) in a first stage, heating the resultant mix to a temperature of from 20° C. to about 140° C. to obtain exclusively a chain lengthening reaction between the functional liquid diene prepolymer and the hydrocarbon chain lengthening bifunctional compound; and

(3) in a second stage, further heating the resultant mix to a higher temperature of from about 145° C. to about 200° C. to effectuate the vulcanization of the chain lengthened reaction product formed at the end of the first stage.

4,104,266

METHOD FOR PREPARATION OF ANTIHEMOPHILIC FACTOR

Milan Wickerhauser, Bethesda, Md., assignor to American National Red Cross, Washington, D.C.

Filed Apr. 14, 1977, Ser. No. 787,425
Int. Cl.[2] A23J *1/06;* A61K *35/14*
U.S. Cl. 260—112 B 4 Claims

1. In a method for the preparation of purified AHF which includes the thawing of frozen plasma at a temperature of between about 0° and about 1° C to obtain a cryoprecipitate containing AHF, the improvement which comprises:

(a) extracting said cryoprecipitate with a low ionic strength buffer solution comprising tris (hydroxymethyl) aminomethane at a temperature of about 0° C to obtain a cold insoluble fraction having cold soluble impurities removed therefrom;

(b) extracting said cold insoluble fraction with a low ionic strength buffer solution comprising tris (hydroxymethyl) aminomethane at a temperature of about 21° C to obtain a solution comprising AHF and said buffer solution;

(c) deprothrombinizing said solution with aluminum hydroxide gel; and

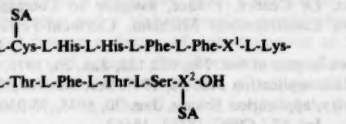
(d) recovering an AHF-rich solution.

4,104,267
SOMATOSTATIN ANALOGS

Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 770,953, Feb. 22, 1977, abandoned. This application Sep. 6, 1977, Ser. No. 830,930
Int. Cl.[2] C07C *103/52*; A61K *37/00*
U.S. Cl. 260—112.5 S 10 Claims

1. A chemical compound of the structure:



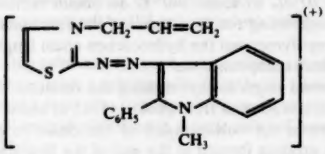
wherein A is hydrogen or the two A groups form a direct bond between the sulfur atoms; X is H, L-Ala-Gly, L-Ala-D-Ala, Gly-Gly-Gly, or Gly-Gly; X^1 is L-Trp, or D-Trp; X^2 is L-Cys, or D-Cys; and the pharmacologically acceptable acid addition salts thereof.

4,104,268
CATIONIC DIAZACYANINE DYESTUFFS

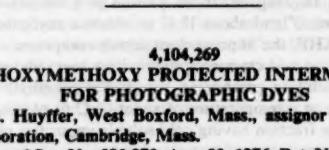
Hans-Lothar Dorsch, Koeln-Stammheim, and Roderich Raue, Leverkusen-Wiesdorf, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jun. 8, 1973, Ser. No. 368,304
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1972, 2228147
Int. Cl.[2] C09B *43/00*
U.S. Cl. 260—158 2 Claims

1. A dyestuff of the formula



2. A dyestuff of the formula

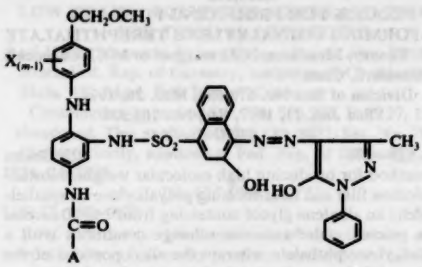


4,104,269
METHOXYMETHOXY PROTECTED INTERMEDIATES FOR PHOTOGRAPHIC DYES

Paul S. Huyffer, West Boxford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 282,872, Aug. 22, 1976, Pat. No. 4,035,401, which is a division of Ser. No. 22,114, Mar. 30, 1970, Pat. No. 3,925,347, which is a continuation of Ser. No. 655,306, Jul. 24, 1967, abandoned. This application Feb. 28, 1977, Ser. No. 773,004
Int. Cl.[2] C09B *29/38*; G03C *5/54, 7/00*
U.S. Cl. 260—162 2 Claims

1. A compound of the formula:



wherein:
X is methyl, methoxy, hydroxy, amino, chloro or carboxy;
m is a positive integer from 1 to 2; and
A is alkyl having from 9–17 carbon atoms.

4,104,270
PROCESS FOR THE MANUFACTURE OF AROMATIC PHOSPHONATES

Nigel Hall; Raymond Price, and Philip Martin Rowbotham, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 15, 1977, Ser. No. 777,648
Claims priority, application United Kingdom, Apr. 26, 1976, 16778/76; May 27, 1976, 22053/76
Int. Cl.[2] C07C *107/06*; C07F *9/40*
U.S. Cl. 260—205 11 Claims

1. A process for the manufacture of aromatic phosphorus derivatives of the formula:

$$Ar.PO(OR)_2 \quad (1)$$

where R is an optionally substituted alkyl, alkenyl, aralkyl, cycloalkyl or aryl radical, and Ar is an aromatic radical linked to the phosphorus atom through a carbon atom of the aromatic radical which comprises contacting a phosphorous acid diester of the formula:

$$HO.P(OR)_2 \quad (2)$$

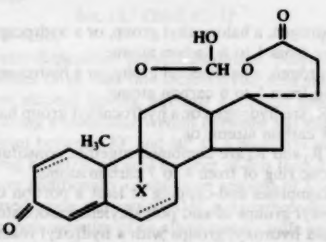
with an aromatic halide of the formula Ar—X in the presence of copper or a copper compound, an acid-binding agent and a solvent, the symbols R and Ar having the meanings stated above and X representing a halogen atom.

4,104,271
11β,18-EPOXY-9α-HALO-17,18-DIHYDROXY-3-OXO-17α-PREGN-4-ENE-21-CARBOXYLIC ACID γ-LACTONES AND CONGENERS

John S. Baran, Winnetka, and Ivar Laos, Skokie, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Jun. 13, 1977, Ser. No. 806,024
Int. Cl.[2] C07J *17/00*
U.S. Cl. 260—239.57 4 Claims

1. A compound of the formula



wherein X represents fluorine, chlorine, or bromine and the dotted lines signify optional Δ^1 and/or Δ^6 unsaturation.

4,104,272

PROCESS FOR THE PRODUCTION OF CONCENTRATED POLYCHLOROPRENE LATICES

Hans-Jürgen Pettelkau, Burscheid, Germany, assignor to Bayer Aktienfesellschaft, Germany

Filed May 3, 1976, Ser. No. 682,359

Claims priority, application Fed. Rep. of Germany, May 7, 1975, 2520339

Int. Cl.² C08L *93/00*

U.S. Cl. 260—27 BB **5 Claims**

1. A process for polymerizing chloroprene together with up to 50% by weight of a comonomer to form a concentrated polymer latex in aqueous alkaline emulsion containing from 55 to 95 parts of water per 100 parts of monomer, said process comprising carrying out said polymerization in the presence of an emulsifier having a pH greater than 10 and comprising

(a) a non-ionic emulsifier in an amount of from 0.01 to 1.0 parts by weight per 100 parts by weight of monomer and either

(b) an alkali metal salt of disproportionated abietic acid in an amount of from 2.0 to 6.0 parts by weight per 100 parts by weight of monomer or

(c) a mixture of an alkali metal salt of disproportionated abietic acid in an amount of from 1.5 to 4.0 parts by weight per 100 parts by weight of monomer and an alkali metal salt of a fatty acid having a chain length of 6 to 25 carbon atoms in an amount of from 0.05 to 3.0 parts by weight per 100 parts by weight of monomer.

4,104,273

DERIVATIVES OF 3-CYANO-PYRID-2-ONES

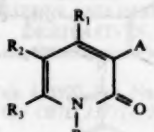
Patrick J. McNulty, Wyndmoor, and Harlow L. Warner, Hatboro, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 513,988, Oct. 11, 1974, Pat. No. 4,028,084. This application Mar. 16, 1977, Ser. No. 777,989

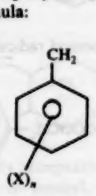
Int. Cl.² C07D *213/57*; A01N *9/22*

U.S. Cl. 260—294.9 **1 Claim**

1. A compound of the formula:



wherein A is cyano; R_1, R_2, R_3 are hydrogen, methyl or ethyl; R is a group of the formula:



wherein X is hydrogen, NH_2, halogen, trifluoromethyl, nitro, or (C_1–C_4) alkyl; *n* is 0–2.

4,104,274

1-SUBSTITUTED-2-(2-PYRIDINYL)ETHANONE N-OXIDES

David T. Connor, Parsippany; Patricia A. Young, Madison, and Maximilian von Strandtmann, Rockaway Township, Morris County, all of N.J., assignors to Warner-Lambert Company, MorrisPlains, N.J.

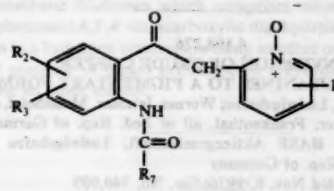
Division of Ser. No. 611,282, Sep. 8, 1975, Pat. No. 4,056,619. This application Aug. 16, 1977, Ser. No. 825,011

Int. Cl.² C07D *213/89*

U.S. Cl. 260—295 AM **1 Claim**

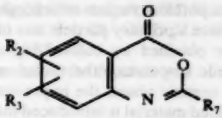
1. A process for preparing a compound of the formula IX:

IX



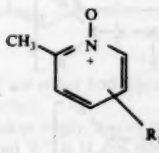
wherein R_1 is hydrogen or lower alkyl; R_2 and R_3 are each hydrogen, halogen, hydroxy, lower alkyl, lower alkoxy or benzyloxy; and R_7 is lower alkyl or phenyl; which comprises reacting a compound of the formula X:

X



wherein R_2, R_3 and R_7 are as defined above in IX, with a substituted 2-picoline N-oxide of the formula V:

V



wherein R_1 is as defined above in IX in liquid ammonia in the presence of an alkali metal amide, to obtain a compound having the formula IX above.

4,104,275

HETEROARYL CROWN ETHERS

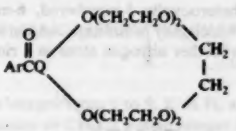
James Charles Kauer, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 615,184, Sep. 19, 1975, Pat. No. 4,024,158. This application Feb. 1, 1977, Ser. No. 764,580

Int. Cl.² C07D *323/00*

U.S. Cl. 260—297 B **14 Claims**

1. A compound of the formula

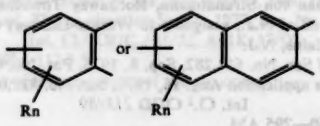


wherein

Ar is thienyl, pyridyl or furyl, each with up to two substitu-

ents of alkyl of 1–10 carbons, alkoxy of 1–10 carbons, halogen, carboxy or cyano groups;

Q is



in which R is fluorine, chlorine, bromine, nitro, amino, or alkyl of 1-10 carbons; and *n* is 0 to 2.

4,104,276

CONVERSION OF CRUDE COPPER PHTHALOCYANINES TO A PIGMENTARY FORM

Joachim Kranz, Ludwigshafen; Werner Jettmar, Mannheim, and Rudolf Polster, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany

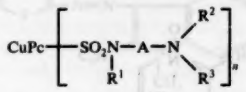
Filed Nov. 8, 1976, Ser. No. 740,009

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1975, 2554252

Int. Cl.² C09B *47/04*

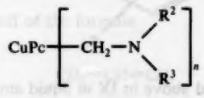
U.S. Cl. 260—314.5 **10 Claims**

1. In a process for converting crude copper phthalocyanines to a pigmentary form by treating finely divided and heavily agglomerated copper phthalocyanines which exhibit disturbed crystallization and have a primary particle size of less than 0.1 μm, and which are obtained by ball-milling crude copper phthalocyanines while suspending the milled material in an organic or aqueous organic phase, the improvement wherein the finely divided milled material is introduced into the organic or aqueous organic medium together with from 0.5 to 7 percent by weight, based on the crude copper phthalocyanine, of one or more basic copper phthalocyanines of the formula



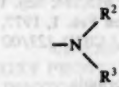
(I)

or

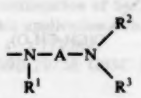


(II)

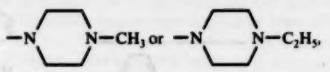
where CuPc is an n-valent copper phthalocyanine radical, R^1 is hydrogen or alkyl of 1 to 4 carbon atoms, A is saturated, linear or branched alkylene of 2 to 6 carbon atoms, the N atoms being on different carbon atoms, R^2 is alkyl of 1 to 20 carbon atoms or alkoxyalkyl of 3 to 12 carbon atoms or cycloalkyl of 6 to 8 carbon atoms, R^3 is hydrogen, alkyl of 1 to 4 carbon atoms or cycloalkyl of 6 to 8 carbon atoms, or the group



is a saturated heterocyclic 5-membered, 6-membered or 7-membered ring which may in addition contain an oxygen atom, sulfur atom or a further nitrogen atom as a ring member, or



denotes



and *n* is a number from 1 to 6, and the mixture is kept at from room temperature to 180° C for recrystallization, after which the pigment is isolated.

4,104,277

PROCESS FOR PREPARING AN ALPHA OR BETA FORM COPPER PHTHALOCYANINE PIGMENT

Robert Langley, Glasgow, Scotland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 15, 1977, Ser. No. 768,811

Claims priority, application United Kingdom, Feb. 19, 1976, 6571/76

Int. Cl.² C09D *47/04*

U.S. Cl. 260—314.5 **13 Claims**

1. A process for preparing an alpha or beta form copper phthalocyanine pigment which comprises dry milling a crude copper phthalocyanine followed by mixing with an aqueous emulsion comprising a liquid amine having from 3 to 20 carbon atoms which is insoluble in water or alkali and soluble in acid and a surfactant which is capable of emulsifying the liquid amine and subsequently acidifying the mixture to dissolve the amine.

4,104,278

PROCESS FOR THE PRODUCTION OF COMPOUNDS WITH ANTIPHLOGISTIC ACTIVITY

Karl-Heinz Boltze, Bensberg-Kippekausen; Otfried Brendler, Cologne (Mülheim), and Peter-Rudolf Seidel, Porz-Wahnheide, all of Germany, assignors to Troponwerke Dinklage & Co., Cologne (Mülheim), Germany

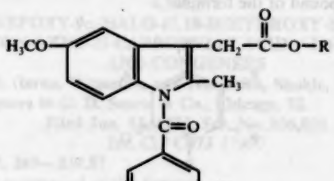
Continuation of Ser. No. 413,135, Nov. 5, 1973, abandoned. This application Dec. 11, 1975, Ser. No. 639,674

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1972, 2257867

Int. Cl.² C07D *209/18*

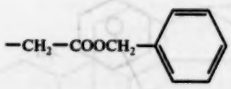
U.S. Cl. 260—326.13 A **13 Claims**

1. Process for the production of a compound of the formula

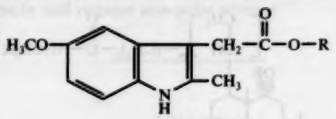


IV

in which R stands for a benzyl radical or the radical

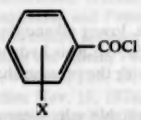


and X is hydrogen or represents one or more of halogen, methoxy, nitro, and trifluormethyl, wherein a compound of the formula



VII

is condensed with a compound of the formula



VIII

in which R and X have the meaning indicated, at temperatures of at least 100° C in an inert solvent as reaction medium, with formation of free HCl.

4,104,279

PROCESS FOR N-AROYLIMIDES

Richard S. Norton, Wilmington, Del., assignor to Suntech, Inc., Wayne, Pa.

Filed Oct. 12, 1976, Ser. No. 731,273
Int. Cl.² C07D *209/34*
U.S. Cl. 260—326 N **13 Claims**

1. A process for making an N-aroyl derivative of an aromatic imide which comprises reacting an aromatic o-dicarboxylic acid anhydride with a nitrile selected from the group of aliphatic and aromatic mono and polynitriles of structure $R—(CN)_n$ where R is the aliphatic or aromatic group containing from one to thirty carbon atoms having no α-hydrogen atom, said aromatic group being of the benzene or naphthalene series and *n* is an integer of from one to two at a temperature of at least about 250° C and in the presence of an acid as a labile proton source.

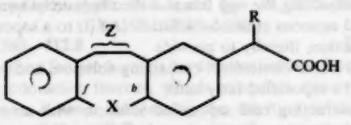
4,104,280

DIBENZO [b.f]THIEPIN AND DIBENZO[b.f]OXEPIN DERIVATIVES

Jack Ackrell, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Feb. 4, 1977, Ser. No. 765,493
Int. Cl.² C07D *337/14, 313/14*
U.S. Cl. 260—327 B **23 Claims**

1. A compound selected from the group of those represented by the formula:



and the pharmaceutically acceptable esters and salts thereof, wherein R is hydrogen or methyl, X is oxygen or $S(O)_n$, in which *n* is the integer of 0, 1 or 2, and Z is a single or double bond, provided that when Z is a double bond X is not SO, and when R is methyl the compounds are (dl) mixtures.

4,104,281

PROCESS FOR PREPARING NOVEL ISOMERIC DICARBOXY, DI (HYDROXYMETHYL) DIPHENYLMETHANE DILACTONES

Anatoli Onopchenko, Monroeville; Johann G. Schulz, Pittsburgh, and Edward T. Sabourin, Allison Park, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 8, 1976, Ser. No. 748,686
Int. Cl.² C07D *307/88, 407/10*
U.S. Cl. 260—343.3 R **11 Claims**

1. A process for converting benzophenone-3,4,3′,4′-tetracarboxylic dianhydride to dicarboxy, di(hydroxymethyl), diphenylmethane dilactones which comprises subjecting said benzophenone-3,4,3′,4′-tetracarboxylic dianhydride to hydrogenation in a hydrogen atmosphere using an ether or ester carrier in the presence of nickel pretreated in a hydrogen atmosphere using an ether solvent.

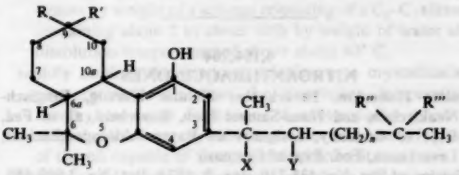
4,104,282

NOVEL 3-(OXYGENATED ALKYL)-1,9-DIHYDROXY AND 1-HYDROXY-9-KETO DIBENZO[b,d]PYRANS

David S. Fukuda, Brownsburg; Bernard J. Abbott, Greenwood, and Robert A. Archer, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 694,512, Jun. 9, 1976, Pat. No. 4,064,009.
This application Aug. 8, 1977, Ser. No. 822,467
Int. Cl.² C07D *311/78*
U.S. Cl. 260—345.3 **5 Claims**

1. A compound of the formula



I

wherein X and Y are either both hydrogen or one is hydrogen and the other methyl;
wherein, when taken singly, one of the pair R and R′ and one of the pair R″ and R‴ is H and the other is OH and, when taken together, the pair R and R′ and the pair R″ and R‴ form the oxygen of a ketone group; and
wherein *n* is 1, 2, 3 or 4.

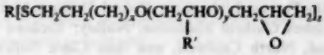
4,104,283

POLYTHIOETHERALKYLENEOXIDE EPOXIDES

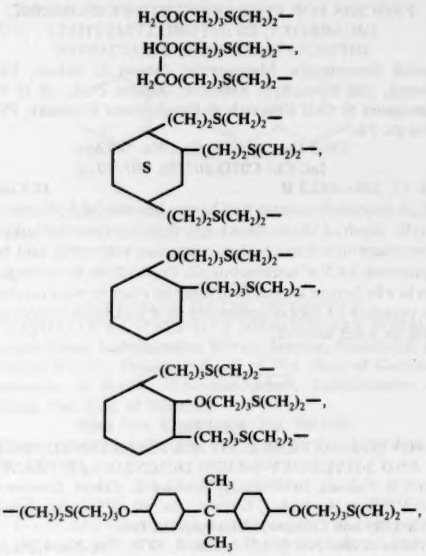
Richard A. Hickner, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 789,954, Jan. 8, 1969, abandoned. This application Nov. 26, 1971, Ser. No. 202,546
Int. Cl.² C07D *303/34*
U.S. Cl. 260—348.43 **12 Claims**

1. Compounds of the structure



wherein *x* is an integer from 1 to 9, R′ is H, an alkyl group of from 1 to 4 C atoms or CH_2Cl, *y* is an integer from 0 to 10, *z* is an integer from 2 to 3 and R is $-(CH_2)_2O(CH_2)_2$, $—(CH_2)_3O(CH_2)_3—$, $—(CH_2)_2S(CH_2)_2—$, $—(CH_2)_2S(CH_2)_2S(CH_2)_2—$, $—(CH_2)_2S(CH_2)_2O(CH_2)_2S(CH_2)_2—$,



or

the reaction product of a polyallyl ether of penterythritol having an average of about 3.5 allyl groups and 1,2-ethanedithiol.

4,104,284

NITROANTHRAQUINONES

Walter Hohmann, Leverkusen; Helmut Herzog, Bergisch-Neukirchen, and Hans-Samuel Bien, Burscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

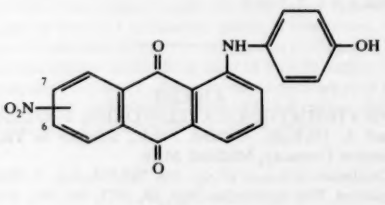
Division of Ser. No. 431,710, Jan. 8, 1974, Pat. No. 3,989,450. This application Jun. 11, 1976, Ser. No. 695,184

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1973, 2305916; Jan. 30, 1973, 2304320

Int. Cl.[2] C07C *97/12*

U.S. Cl. 260—378 **3 Claims**

1. Anthraquinone compound of the formula



4,104,285

TAURINE AND GLYCINE DERIVATIVES

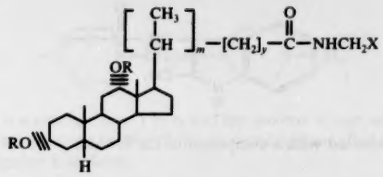
Hugo Gallo-Torres, Livingston; Robert William Guthrie, Fairfield; James Guthrie Hamilton, Nutley; Richard Wightman Kierstead, North Caldwell, and Ann Clare Sullivan, Cedar Grove, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 22, 1977, Ser. No. 790,164

Int. Cl.[2] C07J *9/00*

U.S. Cl. 260—397.1 **17 Claims**

1. A compound of the formula



wherein R is hydrogen, lower alkanoyloxy or benzoyloxy, X is —$COOR_1$ or CH_2SO_3H; R_1 is hydrogen or lower alkyl; *m* and *y* are 0 or 1 with the proviso that when *m* is 0, *y* is 0;

or pharmaceutically acceptable salts thereof.

4,104,286

CHOLESTEROL SEPARATION PROCESS

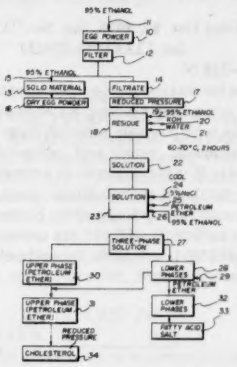
Alexander Graham Fallis, 22 Laurier St., St. John's, Newfoundland, Canada (A1A 2W3); John Marshall William Scott, 34 Poplar Ave., St. John's, Newfoundland, Canada, and June Gertrude Winter, 4 Yellowknife St., St. John's, Newfoundland, Canada (A1A 2Z8)

Filed Jan. 14, 1977, Ser. No. 759,443

Claims priority, application Canada, Nov. 19, 1976, 266152

Int. Cl.[2] C07J *9/00*

U.S. Cl. 260—397.25 **11 Claims**



1. A process for separating and recovering discrete portions from egg which comprises the steps of:

(A) extracting a dried egg powder with an aqueous ethanol solution under mild extraction conditions at a temperature of about 25°–30° C. for a time of from 2–4 hours, thereby providing:

(i) an edible egg solid material from which at least about 70% by weight of cholesterol contained in the egg has been removed, and

(ii) an aqueous ethanolic solution containing egg fats and free cholesterol;

(B) recovering said edible egg solid (A) (i);

(C) subjecting the egg fats and the cholesterol contained in said aqueous ethanolic solution (A) (i) to a saponification reaction, thereby to provide

(iii) a free cholesterol-containing solution, and

(iv) a saponified fatty acid;

(D) extracting said saponified solution with an extractant including an organic non-polar solvent to form at least a two-phase solution;

(E) recovering saponified fatty acid (D) (iv) from an upper phase of said solution;

(F) concentrating said free cholesterol-containing solution in a lower phase of said solution; and

(G) recovering free crystallized cholesterol from said solution in said organic non-polar solvent.

4,104,287

4-m,m'-DI-t-BUTYL-p-HYDROXYPHENYL) BUTYL-2 COMPOUNDS

Roman Fischer, Mutterstadt; Werner Fliege, Oterstadt; Wolfgang Koernig, Mannheim, and Peter Horn, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany

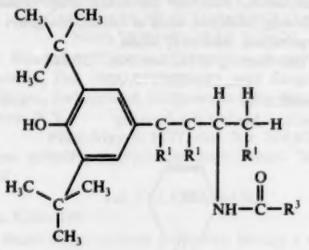
Division of Ser. No. 443,822, Feb. 19, 1974, Pat. No. 4,026,952. This application Nov. 18, 1976, Ser. No. 743,086

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1973, 2309375; Feb. 24, 1973, 2309376; Feb. 24, 1973, 2309377

Int. Cl.[2] C11C *3/02*

U.S. Cl. 260—404 **7 Claims**

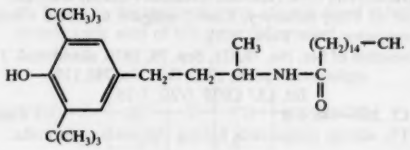
1. 4-(m,m'-di-t-butyl-p-hydroxyphenyl)-butyl-2-amides of the formula:



VI

in which the radicals R^1 are the same or different and each individually is hydrogen or an aliphatic radical, and R^3 denotes an aliphatic, cycloaliphatic, araliphatic or aromatic radical.

7. A compound as claimed in claim 1, said compound having the formula



4,104,288

METHOD FOR PRODUCING HARD BUTTER FRACTION FROM SHEA FAT

Yukiya Iwanaga, Sennan, and Hayato Kubota, Izumi, both of Japan, assignors to Fuji Oil Company, Limited, Osaka, Japan

Filed Nov. 16, 1976, Ser. No. 742,353

Claims priority, application Japan, Nov. 19, 1975, 50-139539

Int. Cl.[2] C11B *1/10*

U.S. Cl. 260—412.8 **5 Claims**

1. A method for producing a hard butter fraction from a shea fat by fractionation thereof, which comprises dissolving the shea fat in n-hexane, maintaining the resulting solution at a temperature of 5° to 10° C to precipitate the gummy unsaponifiable substances in the shea fat, separating the precipitated gummy unsaponifiable substances, cooling the solution obtained after the separation of the gummy substances at a temperature of 25° to 10° C, and collecting the precipitated hard butter fraction.

4,104,289

FILLED THERMOPLASTIC RESIN COMPOSITIONS

Giffin D. Jones, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 20, 1976, Ser. No. 724,888

Int. Cl.[2] C08K *5/34*

U.S. Cl. 260—42.41 **10 Claims**

1. In a curable composition consisting essentially of a normally solid thermoplastic olefinic polymer resin, a normally non-reinforcing finely divided inorganic filler in proportion by weight from 1:4 to 4:1 to the polymer resin, and an ethylenically unsaturated material polymerizable under free-radical initiation to effect curing of the composition, the improvement wherein the ethylenically unsaturated material is trivinylisocyanurate and wherein the trivinylisocyanurate is imbibed on particles of solid thermoplastic polymer of styrene.

4,104,290

PROCESS FOR SEPARATING OILS AND FATS INTO LIQUID AND SOLID FRACTIONS

Ladislav Koslowsky, Ramat-Gan, Israel, assignor to H.L.S. Ltd., Industrial Engineering Company, Petah-Tikva, Israel

Continuation of Ser. No. 612,978, Sep. 12, 1975, abandoned. This application Nov. 4, 1976, Ser. No. 738,914

Claims priority, application Israel, Feb. 7, 1975, 46595

Int. Cl.[2] C11B *7/00, 11/00*

U.S. Cl. 260—428.5 **19 Claims**

1. A process for separating an edible oil selected from the group consisting of natural and semi-processed animal and vegetable oils and fats and mixtures thereof into a less saturated fraction (liquid fraction) and a more saturated fraction (solid fraction) comprising the steps of:

dissolving one part by weight of the oil in about 0.5 to about 4 parts by weight of a solvent consisting of a C_2-C_3 alkanol containing about 2 to about 10% by weight of water at a dissolution temperature of above about 40° C,

rapidly cooling the resulting solution to a crystallization temperature lower than the dissolution temperature, thereby to cause formation of substantially spherical shaped alpha-form crystals of said more saturated fraction of the oil capable of floating in said solvent,

allowing said mixture to separate into three phases consisting of a lower liquid layer comprising said less saturated fraction of the oil and a part of said solvent, an upper liquid layer comprising another part of said solvent, and a solid phase consisting of said crystals of said more saturated fraction of the oil, said solid phase floating in said upper liquid layer to form a suspension therein, and

separating said lower liquid layer from said suspension by decantation.

4,104,291

METAL DITHIOPHOSPHATES AND THEIR MANUFACTURE

Albert R. Sabol, Munster, Ind., and Nicholas C. Petrellis, Lisle, Ill., assignors to Standard Oil Company a corporation of Indiana, Chicago, Ill.

Filed Mar. 28, 1977, Ser. No. 781,626

Int. Cl.[2] C07F *3/06*

U.S. Cl. 260—429.9 **13 Claims**

1. A process for the continuous neutralization of dithiophosphoric acid with metal base comprising:

contacting dialkyl or diaryl dithiophosphoric acid with zinc, barium, cadmium, magnesium or nickel metal base to form a neutralization mixture;

passing said neutralization mixture through a static mixer in order to achieve mixing of the neutralization mixture and substantial neutralization of said dithiophosphoric acid;

cooling the substantially neutralized dithiophosphoric acid; and

recovering metal dithiophosphate.

4,104,292
METHOD FOR PREPARING ORGANOTIN COMPOUNDS

Robert D. Dworkin, Old Bridge, and Adam J. Ejk, Piscataway, both of N.J., assignors to M&T Chemicals Inc., Stamford, Conn.

Filed Nov. 2, 1976, Ser. No. 738,183
Int. Cl.[2] C07F 7/22
U.S. Cl. 260—429.7 17 Claims

1. A method for preparing an organotin compound of the general formula

$$R_qSn[S(CH_2)_mOCR']_{4-q}$$

wherein R and R' are individually selected from the group consisting of alkyl containing from 1 to 20 atoms, cycloalkyl, aryl, alkaryl and aralkyl, *m* represents the integer 2 or 3 and *q* represents the integer 1 or 2, said method consisting essentially of the following sequence of steps:

(1) combining 4-q moles of 2-mercaptoethanol or 3-mercaptopropanol for every one mole of an organostannoic acid, RSnOOH, when *q* is 1 or a diorganotin oxide, R_2SnO, when *q* is 2, and heating the resultant mixture at a temperature of from 40° to 100° C and for a period of time sufficient to substantially complete the reaction;

(2) combining the resultant product with a stoichiometric quantity of a carboxylic acid R'COOH, or an ester thereof, R'COOR", wherein R" is alkyl and contains from 1 to 20 carbon atoms, and subsequently removing the aqueous phase of the reaction mixture;

(3) heating the organic phase of said reaction mixture to a temperature of from 100° to about 180° C and simultaneously removing any by-product water or any alcohol boiling at or below the temperature of the reaction mixture;

(4) removing the resultant organotin compound,

$$R_qSn[S(CH_2)_mOCR']_{4-q}$$

from the reaction vessel.

4,104,293
OIL-SOLUBLE CHROMIUM COMPOSITIONS

Derek Redmore, Ballwin, and Frederick T. Welge, Webster Groves, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed May 5, 1976, Ser. No. 683,407
Int. Cl.[2] C07F 11/00
U.S. Cl. 260—438.5 R 15 Claims

1. A process of preparing oil-soluble chromium compositions having from about 15% to about 30% chromium which comprises reacting hydrated chromium oxide obtained by the reduction of dichromates with an oil-soluble sulfonic acid having about 10 to 60 carbon atoms in a volatile solvent by stirring for a period of about 1 to about 1.5 hours at room temperature and then heating to reflux, removing water and solvent and finally centrifuging to remove insolubles.

5. The process of claim 1 where a carboxylic acid is also employed in the reaction in a molar ratio of sulfonic acid to carboxylic acid of about 10:1 to 1:10.

4,104,294
CRYSTALLINE SILICATES AND METHOD FOR PREPARING SAME

Robert William Grose, Mobile, Ala., and Edith Marie Flanigen, White Plains, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 10, 1977, Ser. No. 850,363
Int. Cl.[2] C07F 7/10, 5/06
U.S. Cl. 260—448 C 2 Claims

1. A crystalline microporous organosilicate having a composition in terms of moles of oxides of:

$$R_2O: 0\text{–}1.5\ M_2O: < 0.05\ Al_2O_3: 40\text{–}70\ SiO_2: x\ H_2O,$$

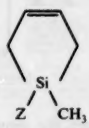
wherein R represents tetraethylammonium cation, M represents an alkali metal cation and *x* has a value of from 0 to 15, the X-ray powder diffraction pattern of said organosilicate having at least the lines set forth in Table I.

4,104,295
METHYLSILACYCLOPENTENYL-CONTAINING SILYLATING AGENTS AND METHOD THEREFOR

Jerome M. Klosowski, Monitor Township, Bay County, and Charles A. Romig, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 1, 1976, Ser. No. 737,744
Int. Cl.[2] C07F 7/10
U.S. Cl. 260—448.2 N 6 Claims

1. A composition having the formula



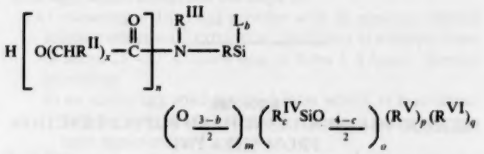
wherein Z is a monovalent amido radical.

4,104,296
ORGANOFUNCTIONAL SILICON COMPOUNDS

Roscoe A. Pike, Simsbury, Conn., assignor to Union Carbide Corporation, New York, N.Y.

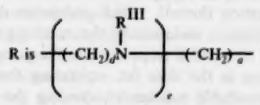
Continuation of Ser. No. 76,321, Sep. 28, 1970, abandoned. This application Apr. 6, 1977, Ser. No. 785,110
Int. Cl.[2] C07F 7/10, 7/18
U.S. Cl. 260—448.8 R 7 Claims

1. The silicon compounds having the average formula:



wherein *x* is about 2 to 8; *n* is at least 1; *b* is 0, 1 or 2; *c* is 0, 1, 2 or 3; *m* is 0 or 1; *o* is 0 or a positive number and when *o* is a positive number, *m* is 1; *p* is equal to 3-*b* when *m* is 0 and *o* is 0, and when *m* is 1, *p* is 0; *q* is 0 when *p* is equal to 3-*b* and *q* is 0 or a positive number when *m* is 1;

R is



wherein $(CH_2)_d$ is bonded to Si; *a* is at least 3; *d* is at least 2; and *e* is 0 or a positive number; each R^{II} is hydrogen or alkyl of 1

to about 4 carbon atoms; R^{III} is hydrogen, alkyl, cycloalkyl, aryl, aminoalkyl, or hydroxyalkyl, which alkyls contain 1 to about 8 carbon atoms; L is a monovalent organic radical bonded to silicon by a carbon to silicon bond; R^{IV} is silicon bonded and is hydrogen or an organic radical bonded to silicon by a carbon to silicon bond; R^{V} is silicon bonded and is one of a hydrolyzable or condensable group selected from the group consisting of hydroxyl, halide, alkali metaloxy, alkoxy, aroxy, and acyloxy; and R^{VI} is bonded to oxygen and is hydrogen, alkyl, alkali metal, aryl, or acyl; provided that L and R^{IV} are organic radicals which do not interfere with the reaction of the lactone and the amino substituent of the silicon compound as recited in claim 2.

4,104,297

THERMOPLASTIC POLYESTERS PREPARED FROM DICARBOXYLIC ACIDS CONTAINING N-HETEROCYCLIC RINGS

Lothar Buxbaum; Thomas Kainmüller, both of Lindenfels, Odenwald, Fed. Rep. of Germany, and Jürgen Habermeier, Pfeffingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 6, 1977, Ser. No. 794,692

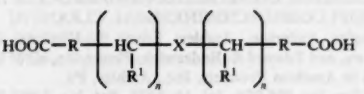
Claims priority, application Switzerland, May 12, 1976, 5935/76

Int. Cl.² C08G *63/68*

U.S. Cl. 528—289 **15 Claims**

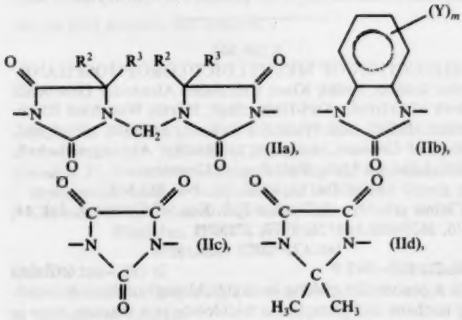
1. A linear thermoplastic polyester, having a relative viscosity of 1.1 to 3.5, measured on a solution of 1 gram of polyester in 100 ml of a solvent consisting of equal parts of phenol and symmetrical tetrachloroethane at 30° C., which comprises the condensation product in about a 1:1 molar ratio of diacids (a) and (b) with diols (c) and (d) so that the composition of the polyester comprises

in the diacid component of the polyester (a) from 1 to 50 mol %, based on the total polyester, of radicals of at least one dicarboxylic acid of the general formula I



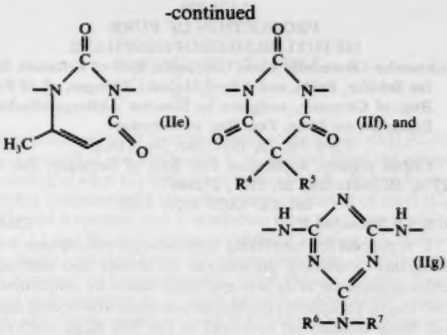
(I)

wherein R^1s each represent a hydrogen atom or alkyl having 1 to 10 C atoms, R represents phenylene or alkylene having 1 to 17 C atoms, and X represents a heterocyclic radical selected from the group consisting of the following formulae IIa to IIg



(IIa), (IIb), (IIc), (IId),

-continued



(IIe), (IIf), and (IIg)

wherein R^2 represents a hydrogen atom, methyl or ethyl, R^3 represents methyl, ethyl, propyl or isopropyl, R^4 and R^5 each represent methyl, ethyl or phenyl, R^6 and R^7 each represent alkyl having 1 to 6 C atoms, cyclohexyl or phenyl, Y represents a bromine or chlorine atom, and *m* is naught or represents a number from 1 to 4, and *n* represents 1 when X is formula IIa to IIf, and *n* represents 0 or 1 when X is formula IIg; and

(b) from 49 to 0 mol %, based on the total polyester, of radicals of at least one aromatic, cycloaliphatic or aliphatic dicarboxylic acid; and in the diol component of the polyester

(c) from 20 to 50 mol %, based on the total polyester, of radicals of an aromatic diol; and

(d) from 30 to 0 mol %, based on the total polyester, of radicals of an aliphatic or cycloaliphatic diol;

wherein the radicals (a) and (b) are attached to the radicals (c) and (d) through ester linkages and in a random distribution when any (b) or (d) radicals are present.

4,104,298

MANUFACTURE OF SULFAMIC ACID HALIDES

Karl-Heinz Koenig, Frankenthal, and Gerhard Hamprecht, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

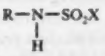
Filed Mar. 23, 1976, Ser. No. 669,467

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1975, 2514937

Int. Cl.² C07C *139/00*

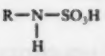
U.S. Cl. 260—543 R **10 Claims**

1. A process for the manufacture of sulfamic acid halides of the formula



I

where R is an aliphatic or cycloaliphatic radical and X is halogen, which comprises: reacting sulfamic acids of the formula



II

where R has the above meanings, or their metal salts, with an acid halide in the presence of a solvent, wherein the reaction is carried out with a phosphorus pentahalide as the acid halide in an amount of from 0.35 to 0.6 mole, per mole of starting material II, in the presence of from 1 to 5 moles of phosphorus oxyhalide per mole of phosphorus pentahalide, and in the presence of from 50 to 300% by weight — based on starting material II — of a halohydrocarbon as the solvent.

4,104,299

PRODUCTION OF PURE METHYLDICHLOROPHOSPHANE

Alexander Ohorodnik; Klaus Gehrmann, both of Erftstadt; Stefan Schäfer, Brühl, and Albert Mainski, Cologne, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 22, 1977, Ser. No. 818,124

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1976, 2633661; May 28, 1977, 2724407

Int. Cl.² C07F *9/52, 9/02*

U.S. Cl. 260—543 P **7 Claims**

1. A process for recovering methyldichlorophosphane from a mixture containing phosphorus trichloride and methyldichlorophosphane as its principal constituents by distillation in two stages, phosphorus trichloride and other low-boiling material being distilled off overhead in the first stage, methyldichlorophosphane being distilled off from high-boiling material in the second stage, and the latter being fed with base product coming from the first stage, which comprises: dissolving in the said mixture, prior to admitting it to the first distillation stage, 0.01 to 1 weight % of a soluble barium phenate-sulfonate mixture or 0.1 to 10 weight % of a non-ionic surfactant wherein a non-ionic polymer derived from ethylene oxide or from ethylene oxide and propylene oxide or wherein an ethoxylated unbranched fatty alcohol having from 6 to 30 carbon atoms is used as the non-ionic surfactant, and admixing the base product coming from the first distillation stage, prior to admitting it to the second distillation stage, with 1 to 10 weight % of phosphorus oxychloride.

4,104,300

METHOD OF PREPARING CARBOXYLIC ACID CHLORIDES OF THE BENZENE SERIES

Günter Zoche, Bonn-Beuel; Hermann Richtzenhain, Much-Schwellenbach, and Wilhelm Vogt, Cologne, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Continuation-in-part of Ser. No. 737,368, Nov. 1, 1976. This application Jul. 7, 1977, Ser. No. 813,595

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1976, 2630429

Int. Cl.² C07C *51/58*

U.S. Cl. 260—544 D **11 Claims**

1. In a process for preparing a substituted or unsubstituted carboxylic acid chloride of the benzene series by reaction of the corresponding carboxylic acid ester with an aromatic compound containing at least one nuclearly bound trichlormethyl group in the presence molybdenum or a molybdenum compound as catalyst wherein the corresponding carboxylic acid chloride is recovered by distillation, the improvement which comprises introducing into the reaction product prior to distillation of the carboxylic acid chloride a complexing agent which complexes with the molybdenum or molybdenum containing catalyst.

4,104,301

SYNTHESIS OF SULFONYL SEMICARBAZIDES

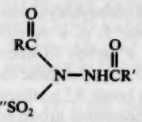
John E. Herweh, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Continuation of Ser. No. 675,452, Apr. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 490,040, Jul. 19, 1974. This application Feb. 18, 1977, Ser. No. 770,016

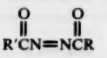
Int. Cl.² C07C *133/02*

U.S. Cl. 260—554 **8 Claims**

1. A process for the manufacture of sulfonyl dicarboxamides of the formula



wherein R and R′ may be the same or different and are C_1 to C_8 alkylamino, di C_1 to C_8 alkylamino, phenylamino, diphenylamino, C_1 to C_8 alkyl substituted phenylamino, di C_1 to C_8 alkyl substituted phenylamino, naphthylamino or dinaphthylamino; R″ is selected from the group consisting of C_1 to C_8 alkyl, phenyl, C_1 to C_8 alkyl substituted phenyl and naphthyl, which comprises reaction in an inert aprotic dipolar solvent a diazenedicarboxamide of the formula



with an organosulfinic acid salt of the formula $R''SO_2M$ wherein R, R′ and R″ is defined above and M is potassium, sodium, zinc or ammonium and recovering the sulfonyl dicarboxamide.

4,104,302

VINYLSULPHONE HARDENERS

Norman Alfred Smith, Hornchurch, and Rainer Kitzing, Ingatestone, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

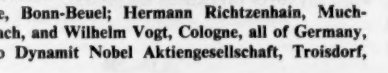
Filed Oct. 22, 1976, Ser. No. 734,781

Claims priority, application United Kingdom, Oct. 31, 1975, 45280/75

Int. Cl.² C07C *103/60;* G03C *1/30*

U.S. Cl. 260—561 S **4 Claims**

1. A vinylsulphone compound of the general formula



wherein *x* is 1 or 2, and *y* is 0 or an integer of 1 to 100.

4,104,303

ACID INHIBITOR COMPOSITION AND PROCESS IN HYDROFLUORIC ACID CHEMICAL CLEANING

James Douglas Anderson, Ambler; Edgar S. Hayman, Jr., Doylestown, and Edward A. Rodzewich, Flourtown, all of Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Division of Ser. No. 595,974, Jul. 14, 1975, Pat. No. 3,992,313. This application Aug. 26, 1976, Ser. No. 717,971

Int. Cl.² C23G *1/06;* C07C *85/18*

U.S. Cl. 260—570.9 **4 Claims**

1. A product prepared by reacting an amine having at least one active hydrogen attached to the nitrogen; an alpha ketone selected from the group consisting of acetophenone and acetone; and formaldehyde, in the presence of hydroxyacetic acid.

4,104,304

PRODUCTION OF METHYLDICHLOROPHOSPHANE

Stefan Schäfer, Brühl; Klaus Gehrmann; Alexander Ohorodnik both of Erftstadt; Karl-Heinz Steil, Hürth; Wernfried Riechmann, Brühl, and Friedhelm Bylsma, Erfstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 11, 1977, Ser. No. 814,465

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1976, 2631608; Apr. 26, 1977, 2718391

Int. Cl.² C07F *9/52, 9/02*

U.S. Cl. 260—543 P **6 Claims**

1. A process for making methyldichlorophosphane by reacting methane and phosphorus trichloride in a reaction zone in

which a temperature higher than 500° C is maintained, which comprises mechanically freeing hot reaction gas coming from the reaction zone from solid matter, and passing the reaction gas freed from solid matter to a quenching zone in which it is quenched with liquefied reaction mixture having 0.3 to 5 weight % of a soluble barium phenate-sulfonate mixture or a non-ionic surfactant dissolved therein wherein an ethoxylated unbranched fatty alcohol having 6 to 30 carbon atoms or wherein a polymeric surfactant derived from ethylene oxide or from ethylene oxide and propylene oxide is used as the non-ionic surfactant.

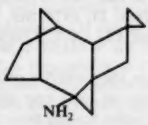
4,104,305

1-AMINOTRICYCLO (4.3.1.1^{2,5}) UNDECANE AND SALTS THEREOF

Yoshiaki Inamoto; Koji Aigami; Motoyoshi Ohsugi; Yoshiaki Fujikura, and Hiroshi Ikeda, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1977, Ser. No. 839,977
Claims priority, application Japan, Oct. 13, 1976, 51-123360
Int. Cl.^{2} C07C *87/40*
U.S. Cl. 260—563 P **2 Claims**

1. 1-Aminotricyclo [4.3.1.1^{2,5}] undecane having the formula (I):



and acid addition salts thereof.

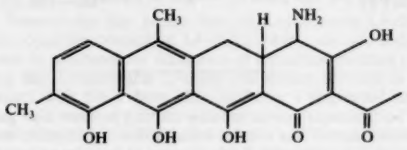
4,104,306

12A-DEOXY CHELOCARDIN

Edith Bernstein, Montreal; Daniel Tim-Wo Chu, Dollard des Ormeaux, and Stuart Nicholas Huckin, Dorion, all of Canada, assignors to Abbott Laboratories, North Chicago, Ill.

Filed May 5, 1976, Ser. No. 683,570
Int. Cl.^{2} C07C *91/16*
U.S. Cl. 260—571 **3 Claims**

1. The compound of the formula



and an acid addition salt thereof.

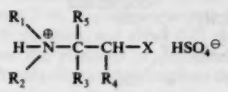
4,104,307

PROCESS FOR PREPARING 2-AMINOALKYL HALIDE BISULFATE SALTS

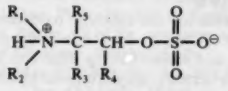
Carmine P. Iovine, Somerset, and Dilip K. Ray-Chaudhuri, Bridgewater, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Jan. 7, 1977, Ser. No. 757,633
Int. Cl.^{2} C07C *85/24*
U.S. Cl. 260—583 G **14 Claims**

1. A process for preparing 2-aminoalkyl halide bisulfate salts of the general formula:



wherein R_1 is selected from the group consisting of alkyl (C_1 to C_{18}), cycloalkyl and hydrogen; R_2 is selected from the group consisting of alkyl (C_1 to C_{18}) and cycloalkyl; R_3, R_4 and R_5 are selected independently from the group consisting of alkyl (C_1 to C_3) and hydrogen; and X is selected from the group consisting of Cl and Br, said process comprising reacting dry hydrogen halide, selected from the group consisting of hydrogen chloride and hydrogen bromide, in an amount ranging from about stoichiometric to 15 mole percent excess, under essentially anhydrous conditions, with the corresponding 2-aminoalkyl monosulfate ester of the general formula:



wherein R_1, R_2, R_3, R_4 and R_5 are all as defined above, the reaction being maintained at about 100° - 200° C.

4,104,308

SYNTHESIS OF SQUARIC ACID

Thomas Richard Gadek; David Berhard Sclove, and Robert Lee Vollmer, all of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 21, 1976, Ser. No. 698,614
Int. Cl.^{2} C07C *45/00*; C07D *295/06*
U.S. Cl. 260—586 R **5 Claims**

1. In a process for the preparation of 3,4-dihidroxy-3-cyclobutene-1,2-dione by the steps of (a) reacting hexachlorobutadiene with an excess of morpholine, the morpholine being present at the start of the reaction in a molar ratio of about 6 to 1 with respect to the hexachlorobutadiene, (b) converting the thus formed 1,1,3-trichloro-2,4,4-trimorpholinobutadiene to 3-morpholinotrichloro-2-cyclobuten-1-one by heating, and (c) hydrolyzing the 3-morpholinotrichloro-2-cyclobuten-1-one to 3,4-dihydroxy-3-cyclobuten-1,2-dione, the improvement according to which the reaction between the hexachlorobutadiene and the morpholine is carried out in the presence of an aromatic hydrocarbon solvent, and at a temperature maintained between 110° C and 120° C, and the conversion of the 1,1,3-trichloro-2,4,-trimorpholinobutadiene to 3,morpholinotrichloro-2-cyclobutene-1-one is carried out in the presence of a buffer at a pH between 4.0 and 7.0.

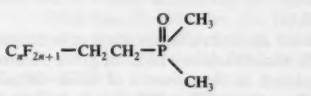
4,104,309

PHOSPHINE OXIDES HAVING POLYFLUORINATED-CHAIN AND THEIR PREPARATION

Joseph Sleziona, and Michel Demarcq, both of Lyons, France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Jan. 3, 1975, Ser. No. 537,446
Claims priority, application France, Jan. 3, 1974, 74.00108
Int. Cl.^{2} C07F *9/53*
U.S. Cl. 260—606.5 P **1 Claim**

1. New products comprising at least one isomer of polyfluorinated-chain phosphine oxides with the general formulae II or III:



(II)

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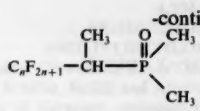


(III)

in which C_nF_{2n+1} represents a perfluorinated aliphatic chain, n lying between 2 and 18.

4,104,310

ORGANOMETALLIC COMPLEXES AS ALKYLAROMATIC OXIDATION CATALYSTS

Howard P. Angstadt, Media, Pa., assignor to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 773,633, Nov. 5, 1968, abandoned. This application Nov. 18, 1974, Ser. No. 524,910

Int. Cl.[2] C07C *179/04*

U.S. Cl. 260—610 B **13 Claims**

1. In the process for the catalytic oxidation of aliphatic or alicyclic olefins having at least one hydrogen atom on the α-carbon atom, said olefins having from 3 to 19 carbon atoms, or secondary or tertiary alkylaromatic hydrocarbons of the formula

wherein R is lower alkyl; R_1 is lower alkyl or hydrogen; and Ar is an aromatic nucleus selected from the group consisting of phenyl and naphthyl, in the presence of air or oxygen at a temperature of from about 80° to 150° C to form hydroperoxides, the decomposition products thereof, or mixtures of the same, the improvement wherein the catalyst is of the formula

$$MX_n(DASO)_m$$

wherein DASO is a dialkylsulfoxide, the alkyl moiety of which has from one to four carbon atoms; MX is a metal salt wherein M is a transition metal cation of Group IB, IIB, IIIB, IVB, VB, VIB, VIIB, VIIIB or IIa of the Periodic Table and X is the anion of said metal salt; m is an integer of from 1 to 8; and n is an integer of from 1 to 4, wherein the ratio of said catalyst to said olefin or alkylaromatic hydrocarbon is from about 0.01 to 5.0 parts by weight of catalyst per 100 parts by weight of olefin or alkylaromatic hydrocarbon.

4,104,311

ORGANOMETALLIC COMPLEXES AS OXIDATION CATALYSTS

Howard P. Angstadt, Media, Pa., assignor to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 801,187, Feb. 20, 1969, abandoned. This application Nov. 20, 1974, Ser. No. 525,548

Int. Cl.[2] C07C *179/04*

U.S. Cl. 260—610 B **13 Claims**

1. In the process for the catalytic oxidation of aliphatic or alicyclic olefins having at least one hydrogen atom on the α-carbon atom, said olefins having from 3 to 19 carbon atoms, or secondary or tertiary alkylaromatic hydrocarbons of the formula

wherein R is lower alkyl; R_1 is lower alkyl or hydrogen; and Ar is an aromatic nucleus selected from the group consisting of phenyl and naphthyl, in the presence of air or oxygen at a temperature of from about 80° to 150° C to form hydroperoxides, the decomposition products thereof, or mixtures of the same, the improvement wherein the catalyst is of the formula

$$MX_n(TAP)_m$$

wherein TAP is a trialkylphosphate, the alkyl moiety of which has from one to four carbon atoms; MX is a metal salt wherein M is a transition metal cation of Group IB, IIB, IIIB, IVB, VB, VIB, VIIB, VIIIB or IIA of the Periodic Table and X is the anion of said metal salt; m is an integer of from 1 to 8; and n is an integer of from 1 to 4, wherein the ratio of said catalyst to said olefin or alkylaromatic hydrocarbon is from about 0.01 to 5.0 parts by weight of catalyst per 100 parts by weight of olefin or alkylaromatic hydrocarbon.

4,104,312

OXIDATION OF OLEFINS WITH ORGANOMETALLIC COMPLEX CATALYSTS

Howard P. Angstadt, Media, and William P. Griffin, Jr., Pittsburgh, both of Pa., assignors to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 777,493, Nov. 20, 1968. This application Nov. 21, 1974, Ser. No. 526,036

Int. Cl.[2] C07C *179/04*

U.S. Cl. 260—610 B **11 Claims**

1. In the process for the catalytic oxidation of aliphatic or alicyclic olefins having at least one hydrogen atom on the α-carbon atom, said olefins having from 3 to 19 carbon atoms, in the presence of air or oxygen at a temperature of from about 50° to 150° C to form hydroperoxides, the decomposition products thereof, or mixtures of the same, the improvement wherein the catalyst is of the formula

$$MX_n(HAPA)_m$$

wherein HAPA is a hexaalkylphosphoramide, the alkyl moiety of which has from one to four carbon atoms; MX is a metal salt wherein M is a transition metal cation of Group IB, IIB, IIIB, IVB, VB, VIB, VIIB, VIIIB or IIA of the Periodic Table and X is the anion of said metal salt; m is an integer of from 1 to 8; and n is an integer of from 1 to 4, wherein the ratio of said catalyst to said olefin is from about 0.1 to 5.0 parts by weight of catalyst per 100 parts by weight of olefin.

4,104,313

HALOGENATED 4-TRIFLUOROMETHYL-4'-NITRO-DIPHENYL-ETHER

Lothar Rohe, Wuppertal; Jürgen Schramm, Dormagen; Erich Klauke, Odenthal-Hahnenberg; Ludwig Eue, and Robert Rudolf Schmidt, both of Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 483,332, Jun. 26, 1974, abandoned. This application May 14, 1976, Ser. No. 686,349

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1973, 2333848

Int. Cl.[2] C07C *43/20, 43/28*

U.S. Cl. 260—612 R **1 Claim**

1. Halogenated 2,6-dichloro-3'-fluoro-4-trifluoromethyl-4'-nitrodiphenyl-ether.

4,104,314
ETHER COMPOUNDS
Ross C. Terrell, Plainfield, N.J., assignor to Airco, Inc., Montvale, N.J.
Division of Ser. No. 705,369, Jul. 14, 1976, Pat. No. 4,059,639, which is a division of Ser. No. 633,763, Nov. 20, 1975, Pat. No. 3,987,111, which is a division of Ser. No. 367,596, Jun. 6, 1973, Pat. No. 3,947,595, which is a division of Ser. No. 170,954, Aug. 11, 1971, Pat. No. 3,764,706. This application Sep. 6, 1977, Ser. No. 830,735
Int. Cl.[2] C07C *43/12;* A61K *31/08*
U.S. Cl. 260—614 F 1 Claim

1. The compound having the formula $CF_3CHClOCF_2CF_2H$.

4,104,315
PROCESS FOR SEPARATING AN AR, AR-DIHALO-AR-ALKYLBENZENE FROM AN ISOMERIC MIXTURE OF AR, AR-DIHALO-AR-ALKYLBENZENES
James R. Dewald, Bay City, Mich., and Lowell D. Markley, Clayton, Calif., assignors to The Dow Chemical Company, Midland, Mich.
Continuation-in-part of Ser. No. 707,924, Jul. 22, 1976, Pat. No. 4,059,642. This application Mar. 10, 1977, Ser. No. 776,168
Int. Cl.[2] C07C *25/04*
U.S. Cl. 260—650 R 7 Claims

1. A process for separating ar,ar-dihalo-ar-alkylbenzenes wherein two of the ring substituents are meta oriented with respect to each other and wherein alkyl includes substituted alkyl, said process comprising (1) contacting an isomeric mixture containing an ar,ar-dihalo-ar-alkylbenzene having the substituents in the 1,2,4- ring positions (1,2,4- isomer) and an isomer thereof having the substituents in the 1,3,5-ring positions (1,3,5- isomer) with an alkylating agent in the presence of a catalytic amount of a Friedel-Crafts catalyst at a reaction temperature less than about 90° C such that the 1,2,4- isomer is preferentially alkylated and (2) separating the alkylated 1,2,4-isomer from the unreacted 1,3,5- isomer.

4,104,316
PROCESS FOR THE PREPARATION OF 2-CHLOROBUTA-1,3-DIENE
Gerhard Scharfe, and Rupert Wenzel, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
Filed Jul. 6, 1976, Ser. No. 702,834
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1975, 2533429
Int. Cl.[2] C07C *17/34, 21/20*
U.S. Cl. 260—655 11 Claims

1. Process for the production of 2-chlorobuta-1,3-diene which comprises contacting 3,4-dichlorobut-1-ene and sodium butylate in n-butanol for formation of a reaction mixture containing said 2-chlorobuta-1,3-diene and sodium chloride in the n-butanol with the sodium chloride being a suspended solid, passing said reaction mixture without having separated off the sodium chloride into a distillation column and therein distilling said reaction mixture to separate the 2-chlorobuta-1,3-diene as top product and n-butanol having the sodium chloride suspended therein as sump product.

4,104,317
DEHYDROGENATION METHOD
George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.
Division of Ser. No. 684,811, May 10, 1976, abandoned, which is a continuation-in-part of Ser. No. 555,648, Mar. 5, 1975, Pat. No. 3,956,103. This application Mar. 7, 1977, Ser. No. 775,079
Int. Cl.[2] C07C *15/00;* C07B *3/00*
U.S. Cl. 260—666 A 28 Claims

1. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon, at dehydrogenation conditions, with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % rhodium, and about 0.01 to about 2 wt. % rhenium; wherein the platinum or palladium, rhodium and rhenium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum or palladium is present in the elemental metallic state; and wherein substantially all of the rhenium and rhodium are present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrogenation conditions or in a mixture of these states.

4,104,318
PROCESS FOR REMOVING ORGANIC OXYGEN-CONTAINING IMPURITIES FROM AN ORGANIC COMPOSITION IN THE PRESENCE OF STEAM
Stephen S. Hupp, Reserve Township, Allegheny County; Edward T. Sabourin, Allison Park; Harold E. Swift, Gibsonia, and Roger F. Vogel, Butler, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.
Filed May 27, 1977, Ser. No. 801,038
Int. Cl.[2] C07C *15/00*
U.S. Cl. 260—669 A 23 Claims

1. The process for substantially increasing the amount of stilbene and substantially reducing the aromatic carbonyl and aromatic hydroxyl impurities in an organic composition comprising toluene, stilbene, benzene and bibenzyl and containing aromatic carbonyl and aromatic hydroxyl impurities which comprises contacting said organic composition with a catalyst comprising a Group VIb or Group VIII metal oxide, metal phosphate or a mixture thereof and a promoter amount of an alkali metal or an alkaline earth metal compound at a temperature between about 400° C. to about 700° C. in the presence of about two to about 90 weight percent steam, whereby the amount of stilbene is substantially increased and the amount of said aromatic carbonyl and aromatic hydroxyl impurities is substantially decreased.

4,104,319
ETHYLATION OF MONO ALKYL BENZENE
Warren W. Kaeding, Westfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Jun. 23, 1977, Ser. No. 809,510
Int. Cl.[2] C07C *3/52*
U.S. Cl. 260—671 C 12 Claims

1. Process for effecting ethylation of a mono alkyl benzene wherein the alkyl substituent contains 1 to 2 carbon atoms to yield a mixture of ethyl toluene or diethylbenzene isomers with minimal undesired by-product formation which comprises contacting said mono alkyl benzene with an ethylating agent, under conversion conditions, including a temperature between about 250° C. and about 600° C., a pressure between about 0.1 and about 100 atmospheres, utilizing a feed weight hourly space velocity between about 0.1 and about 1000 and a molar feed ratio of toluene/ethylating agent between about 1 and about 10, in the presence of a catalyst comprising a crystalline aluminosilicate zeolite characterized by a constraint index within the approximate range of 1 to 12 and a silica to alumina ratio greater than about 500.

4,104,320
METHOD OF DEHYDROCYCLIZING ALIPHATIC HYDROCARBONS
Jean René Bernard, St-Symphorien sur Ozon, and Jean Nury, Caluire, both of France, assignors to Elf-Union, Paris, France
Filed Aug. 30, 1976, Ser. No. 718,584
Claims priority, application France, Sep. 10, 1975, 75 27781
Int. Cl.[2] C07C *15/02;* B01J *29/28*
U.S. Cl. 260—673.5 25 Claims

1. A method of dehydrocyclising non-cyclic aliphatic hy-

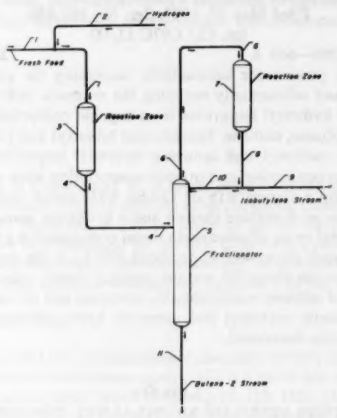
drocarbons, characterised in that in the presence of hydrogen a batch of the hydrocarbons is contacted at a temperature of 430° - 550° C with a catalyst consisting essentially of a type L zeolite having exchangeable cations of which at least 90% are alkali metal ions selected from the group consisting of ions of sodium, lithium, potassium, rubidium and caesium and containing at least one metal selected from the group which consists of metals of group VIII of the periodic table of elements, tin and germanium, said metal or metals including at least one metal from group VIII of said periodic table having a dehydrogenating effect, so as to convert at least part of the batch into aromatic hydrocarbons.

4,104,321

PROCESS FOR THE SEPARATION OF OLEFINS

Dennis J. Ward, South Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Mar. 18, 1977, Ser. No. 779,414
Int. Cl.[2] C07C *11/02, 5/24*
U.S. Cl. 260—677 A **9 Claims**



1. A process for the separation of isoolefin and normal olefin hydrocarbons from a mixture containing the same, which comprises the steps of:

(a) subjecting said mixture to isomerization in a first isomerization zone to convert a portion of the normal olefin hydrocarbons to isoolefin;

(b) fractionating the resultant isomerization zone effluent to separate the same into an isoolefin-rich stream containing normal olefin and a normal olefin-rich stream of reduced isoolefin content;

(c) subjecting said isoolefin-rich stream to isomerization in a second isomerization zone to isomerize normal olefin hydrocarbons contained therein;

(d) recovering an isoolefin product stream from the effluent of said second zone; and

(e) separately recovering said normal olefin-rich stream from the aforesaid fractionating step (b).

4,104,322

RUBBER COMPOSITIONS CONTAINING POLYSILOXANE ELASTOMERS AND BUTADIENE-STYRENE COPOLYMERS

Kenneth E. Snavely, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 24, 1975, Ser. No. 598,898
Int. Cl.[2] C08L *83/04*
U.S. Cl. 260—827 **14 Claims**

1. A rubber blend comprising:

a. a silicone rubber having a formula

wherein the radicals R, which can be the same or different, can be alkyl, cycloalkyl, aryl radicals which can be unsubstituted or substituted by alkyl, cycloalkyl and aryl radicals, said radicals R containing 1 to about 12 carbon atoms and wherein 0 to about 5 percent of the radicals R are olefinically unsaturated radicals having from 2 to about 12 carbon atoms,

b. Z weight percent or less of the total blend of a hydrocarbon rubber selected from the group consisting of solution polymerized hydrocarbon rubbers, emulsion polymerized hydrocarbon rubbers, and mixtures thereof, Z being defined by the formula

$$Z = 15 + 25 \cdot (P/100)$$

wherein P which can be any value between 0 and 100 is the weight percentage of solution polymerized hydrocarbon rubber in the total hydrocarbon rubber of the blend, said hydrocarbon rubber being a copolymer of a conjugated alkadiene having 4–12 carbon atoms per molecule and a vinyl-substituted aromatic monomer of 8 to about 18 carbon atoms, and

c. up to 0.003 weight % (calculated as sulfur) of sulfur or a sulfur-containing compound,
up to 0.07 weight % ionic surfactants,
up to 0.03 weight % water,
up to 0.1 weight % antioxidants.

4,104,323

ADHESIVE COMPOSITION CONTAINING A PRE-BLENDED POLYPHENYLENE ETHER RESIN

David R. Hansen, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 18, 1977, Ser. No. 788,186
Int. Cl.[2] C08L *45/00, 53/00*
U.S. Cl. 260—829 **9 Claims**

1. A hot melt adhesive composition comprising:

(a) 100 parts by weight of a block copolymer having at least two monoalkenyl arene polymer end blocks A and at least one elastomeric conjugated-diene mid-block B, said blocks A comprising 8 - 55% by weight of the block copolymer;

(b) about 50 to about 200 parts by weight of a tackifying resin compatible with block B;

(c) about 0 to about 200 parts by weight of a hydrocarbon extending oil; and

(d) about 5 to about 50 parts by weight of a melt blend of

(i) a low molecular weight polyphenylene ether resin, and

(ii) a block A compatible resin selected from the group consisting of coumarone-indene resins, vinyltoluene-alphamethyl-styrene copolymers and mixtures thereof, wherein the weight ratio of the polyphenylene ether resin to the block A compatible resin is between about 1:1 and about 1:6, the molecular weight (M_w) of the polyphenylene ether resin is between about 6,000 and about 25,000, the glass transition temperature of the polyphenylene ether resin is between 170° C and 205° C; and the glass transition temperature of the block A compatible resin is between about 40° C and about 100° C.

4,104,324

DEEP-DYEING POLYCAPROLACTAM FIBRES AND FILAMENTS

Eduard Radlmann; Hans-Georg Gelhaar, and Günther Nischk, all of Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

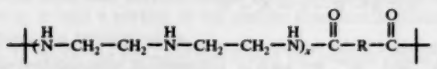
Filed Sep. 21, 1977, Ser. No. 835,310

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1976, 2642980

Int. Cl.[2] C08L *77/00*

U.S. Cl. 260—857 TW 5 Claims

1. Basically modified polycaprolactam filaments or fibres comprising a physical mixture of an unmodified polycaprolactam and a basic polycaprolactam containing structural units corresponding to the formula:



in which

R represents an alkylene radical with 4 to 12 carbon atoms, and

x is an integer from 1 to 5, having a solution viscosity of from 2.9 to 3.5 (as measured on a solution of 1 g of non-extracted polyamide in 100 ml of m-cresol at 25° C) and containing free amino groups in a concentration range from 60 to 180 millivals per kg of fibre.

4,104,325

RESIN COMPOSITION COMPRISING CYANO-SUBSTITUTED NORBORENE POLYMERS BLENDED WITH GRAFT COPOLYMERS

Takashi Ueshima, Yokohama; Yasuzi Tanaka; Toshiro Yokoyama, both of Kawasaki, and Shoichi Kobayashi, Yokohama, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan

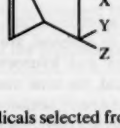
Division of Ser. No. 452,623, Mar. 19, 1974, Pat. No. 4,021,510. This application Jan. 10, 1977, Ser. No. 758,314

Claims priority, application Japan, Sep. 19, 1972, 47-93273; Oct. 4, 1973, 48-110957; Oct. 5, 1973, 48-111526

Int. Cl.[2] C08L *51/04, 51/06, 55/02*

U.S. Cl. 260—876 R 4 Claims

1. Rosin compositions comprising 5 to 95 parts by weight of polymers prepared by ring-opening polymerization of cyano-substituted norbornene derivatives and 95 to 5 parts by weight of graft copolymers prepared by grafting at least one vinyl compound selected from the group consisting of styrene, acrylonitrile and methyl methacrylate to at least one elastomer selected from the group consisting of butadien rubbers, acrylic esters rubbers, chlorinated polyethylene and ethylene-propylene rubbers, said cyano-substituted norbornene derivatives being expressed by the general formula



where:

W, X, Y and Z = radicals selected from the group consisting of hydrogen, nitrile group, substituents containing nitrile group, alkyl radical having 1 to 20 carbon atoms, alkenyl radical having 1 to 20 carbon atoms, aryl radical having 1 to 20 carbon atoms and aralkyl radical having 1 to 20 carbon atoms; and at least one of said W, X, Y and Z is the radical being selected from the group consisting of nitrile group and substituents containing nitrile group.

4,104,326

RESINOUS RADIAL-LINEAR COPOLYMER BLEND HAVING BLOCKS WITH A HETEROGENEITY INDEX RANGING FROM 2.5 TO 4

Lawrence M. Fodor, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 7, 1977, Ser. No. 813,582

Int. Cl.[2] C08L *51/00, 53/00*

U.S. Cl. 260—876 B 10 Claims

1. A composition comprising a blend of:

(1) at least one resinous radial block copolymer of at least one monovinyl-substituted aromatic compound and at least one conjugated diene, said radial block copolymer having a configuration $(A—B)_nY$, wherein A represents a block of polymerized monovinyl-substituted aromatic compound, B represents a block of polymerized conjugated diene, Y represents a residue of a polyfunctional coupling agent, and *n* represents the number of functional groups of the coupling agent which have entered into the coupling reaction and is an integer of at least 3, said monovinyl-substituted aromatic compound blocks having a heterogeneity index outside the range of 2.5 to 4; and

(2) at least one resinous linear block copolymer of at least one monovinyl-substituted aromatic compound and at least one conjugated diene, said resinous linear block copolymer having a configuration selected from A—B—A and $(A—B)_2X$, wherein A and B are as defined above and X is a residue of a difunctional coupling agent, said monovinyl-substituted aromatic compound blocks having a heterogeneity index outside the range of 2.5 to 4;

said blend having a heterogeneity index of said monovinyl-substituted aromatic compound blocks within the range of 2.5 to 4.

4,104,327

ADHESIVE COMPOSITIONS

Hisaaki Inoue, Fujisawa; Hisataka Komai, Kamakura, and Seiichi Okada, Yokohama, all of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Jan. 12, 1976, Ser. No. 648,325

Claims priority, application Japan, Jan. 16, 1975, 50/7211; Jan. 22, 1975, 50/9578

Int. Cl.[2] C08L *7/00, 9/00, 9/06*

U.S. Cl. 260—876 B 20 Claims

1. An adhesive composition consisting essentially of

(A) 100 parts by weight of an elastomer consisting of (I) 30 to 100% by weight of a thermoplastic elastomer expressed by the general formula $(S\text{-}B)_{n \text{ or } (S\text{-}B)n\text{-}1}—S$ in which S is substantially a polystyrene block, B is substantially a polybutadiene block, and n is an integer of from 2 to 10, and (II) 70 to 0% by weight of a thermoplastic elastomer expressed by the general formula $(S—I)_n$ or $(S\text{-}I)_{n\text{-}1}—S$ in which S is substantially a polystyrene block, I is substantially a polyisoprene block, and n is an integer of from 2 to 10, and

(B) 50 to 250 parts by weight of a hydrocarbon tackifier resin containing 40 to 95% by weight of a 1,3-pentadiene unit and 60 to 5% by weight of an α-methylstyrene unit in the polymer chain and having a softening point of 60° to 140° C.

4,104,328
IMPACT RESISTANT THERMOPLASTIC MOLDING COMPOSITIONS

Johann Swoboda; Rudolf Stephan, both of Ludwigshafen, and Gerhard Heinz, Weisenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 5, 1976, Ser. No. 646,602

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1975, 2503966

Int. Cl.[2] C08L *51/04*

U.S. Cl. 260—876 R **6 Claims**

1. A thermoplastic molding composition consisting essentially of:

(A) from 80 to 50% w/w, based on (A+B), of an 80:20 to 60:40 w/w copolymer of styrene and acrylonitrile; and

(B) from 20 to 50% w/w, based on (A+B), of a graft copolymer of

(1) from 20 to 50% w/w, based on (B), of an 80:20 to 60:40 w/w mixture of styrene and acrylonitrile grafted on

(2) from 80 to 50% w/w, based on (B), of a rubbery polymer containing polymerized units of

(α) from 10 to 100% w/w, based on the rubbery polymer (B2), of butadiene,

(β) from 0 to 90% w/w, based on the rubbery polymer (B2), of an alkyl acrylate having from 1 to 8 carbon atoms in the alkyl, and

(γ) from 0 to 30% w/w, based on the rubbery polymer (B2), of another monomer selected from the group consisting of isoprene, styrene, acrylonitrile and their alkyl derivatives, the percentages given under (α), (β) and (γ) totaling 100% w/w,

with the proviso that the rubbery polymer (B2) serving as base for the graft copolymer has been prepared in a primary stage by polymerization of the monomers (α), (β) and (γ) in the proportions recited under (B2), said polymerization being carried out in an aqueous emulsion and in the presence of from 0.2 to 5% w/w, based on said monomers used in the primary stage, of an alkanol of from 1 to 4 carbon atoms.

4,104,329
ACRYLATE-MODIFIED ETHYLENE-VINYL ACETATE POLYMER

Sabet Abdou-Sabet, and J. Paul Ferrin, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 10, 1977, Ser. No. 805,535

Int. Cl.[2] C08F *263/04*

U.S. Cl. 260—878 R **20 Claims**

1. An acrylate-modified EVA polymer which comprises the product of EVA polymer and polyfunctional acrylate of the formula

$$R'(-O-\overset{O}{\overset{\|}{C}}-CR=CH_2)_x$$

wherein x is 2 to 5, R is hydrogen or methyl, and R' is C_1-C_{10} alkane radical, hydroxyalkane radical or said alkane radicals interrupted by —O—, phenylene, phenyleneoxy, or isocyanurate radical in which the product is substantially free of cross-links.

11. A process for the preparation of acrylate-modified EVA polymer which comprises masticating massed EVA polymer and, in an amount effective to modify but without substantially cross-linking the polymer, polyfunctional acrylate of the formula

$$R'(O-\overset{O}{\overset{\|}{C}}-CR=CH_2)_x$$

wherein x is 2 to 5, R is hydrogen or methyl, and R' is C_1-C_{10} alkane radical, hydroxyalkane radical or said alkane radicals interrupted by —O— phenylene, phenyleneoxy, or isocyanurate radical, at a temperature and for a time sufficient to effect modification of the polymer.

4,104,330
SYNTHESIS AND COPOLYMERIZATION OF TAPERED BLOCK MACROMER MONOMERS

Morris J. Danzig, Skokie, Ill., and Ralph Milkovich, Murrysville, Pa., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed May 27, 1976, Ser. No. 690,757

Int. Cl.[2] C08F *297/04*

U.S. Cl. 260—880 B **61 Claims**

1. A copolymerizable tapered block macromolecular monomer of the formula:

$$I-A-B-C-A'-X$$

wherein I is the residue of a monofunctional anionic initiator "A" and "A'" are each a polymerized mono-alkenyl-substituted aromatic hydrocarbon, "B" is a polymer of a conjugated diene, "C" is a tapered copolymer of a mono-alkenyl-substituted aromatic hydrocarbon and a conjugated diene, "X" is a copolymerizable end group containing either a vinyl moiety, a vinylene moiety, an epoxy moiety, or a thioepoxy moiety, said tapered block macromolecular monomer having a molecular weight in the range of from about 5,000 to about 50,000 and being further characterized as having no more than one vinyl moiety, vinylene moiety, epoxy, or thioepoxy moiety on the terminal portion per linear copolymer chain.

4,104,331
PROCESS FOR THE PREPARATION OF NOVEL BLOCK POLYMERS

Robert E. Cunningham, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 536,540, Dec. 26, 1974, abandoned, which is a continuation-in-part of Ser. No. 385,916, Aug. 6, 1973, abandoned. This application Sep. 24, 1975, Ser. No. 616,354

Int. Cl.[2] C08F *297/04*

U.S. Cl. 260—880 B **8 Claims**

7. A block polymer composition according to claim 5 wherein the alkyl substituted styrene is selected from the group consisting of vinyl toluene, p(t-butyl) styrene, vinyl xylene and p(ethyl) styrene.

4,104,332
COUPLING OF ALKALI METAL-TERMINATED POLYMERS

Robert P. Zelinski, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 678,097, Apr. 19, 1976, Pat. No. 4,039,633. This application Mar. 14, 1977, Ser. No. 777,218

Int. Cl.[2] C08F *8/04, 8/18, 8/00*

U.S. Cl. 260—880 B **9 Claims**

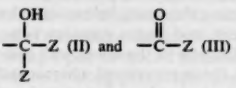
1. A polymer having the structure

$$A(Y')_{n-1}YR_{6-n} \qquad (I)$$

wherein A represents a benzene ring, wherein the radicals R which can be the same or different, are selected from the group consisting of hydrogen and hydrocarbyl radicals with 1–6 carbon atoms per radical, the total number of carbon atoms in all R radicals being between 0 and about 10, wherein n is 2, 3 or 4, wherein the radicals Y' which can be the same or different, are selected from the group of radicals consisting of —Y and

$$-\overset{O}{\overset{\|}{C}}-OR'',$$

wherein —Y is a radical selected from the group of radicals represented by the formulae



wherein R'' is hydrogen or a hydrocarbyl radical having 1–10 carbon atoms and the radicals Z, which can be the same or different, are selected from the group consisting of polymer chains of one or more alkadienes having 4–12 carbon atoms and copolymer chains of one or more alkadienes having 4–12 carbon atoms and one or more monovinylarenes of 8–18 carbon atoms, having the vinyl radical attached to an arene ring carbon atom, said polymer chains being unhydrogenated or having at least a portion of the olefinic unsaturation thereof removed by hydrogenation,

with the further provision that at least 160 polymer chains Z are present in 100 molecules of the formula (I).

4,104,333

SELF-CURING ARTIFICIAL FINGERNAILS

Henry L. Lee, Jr., Pasadena, and Jan A. Orlowski, Altadena, both of Calif., assignors to Lee Pharmaceuticals, South El Monte, Calif.

Continuation of Ser. No. 665,214, Mar. 9, 1976, abandoned, which is a continuation of Ser. No. 527,221, Nov. 26, 1974, abandoned. This application Nov. 29, 1977, Ser. No. 855,629

Int. Cl.[2] C08F *265/06*

U.S. Cl. 260—885 **13 Claims**

1. A self-curing, dermatologically acceptable composition to be applied to a natural nail as a hardenable coating or to form an artificial nail, which composition consists essentially of a mixture of the following ingredients, by weight based on the total weight of the composition:

(a) from about 5% to about 80% of a first addition polymerizable, ethylenically unsaturated monomer that can form a cross-linked polymer upon polymerization during self-curing of the composition, which monomer contains in its molecule at least two groups that are capable of being addition polymerized upon contact with a peroxide-type free radical initiator and a tertiary amine-type accelerator, the polymerizable groups being members of the group consisting of allyl, acryloyl, methacryloyl, or combinations thereof;

(b) a second monomer that is monoethylenically unsaturated, in an amount up to about 60%, that copolymerizes with the first monomer upon self-curing of the composition to form a copolymeric structure that is cross-linked, the second monomer being either tetrahydrofurfuryl acrylate or tetrahydrofurfuryl methacrylate;

(c) a peroxide-type free radical initiator;

(d) a tertiary amine-type accelerator; and

(e) from about 5% to about 60% of a polymeric filler that is at least partially soluble in the composition;

the composition being formulated and the initiator and the accelerator being present in a quantity to cause self-curing to occur in situ within about 120 to about 400 seconds after mixture of the ingredients and application to a nail, under ambient conditions to which the nail is normally exposed including ambient temperature and the presence of atmospheric oxygen.

4,104,334

RUBBER COMPOSITION

Kenneth E. Snavely, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 9, 1975, Ser. No. 621,099

Int. Cl.[2] C08L *9/06, 23/22*

U.S. Cl. 260—888 **6 Claims**

1. A halogen-free vulcanizable rubber composition consisting essentially of

from 70 to 90 parts per hundred parts rubber of at least one butyl rubber, and

from 30 to 10 parts per hundred parts rubber of at least one solution formed random copolymer of at least one vinylaromatic monomer of 8 to 12 carbon atoms and a conjugated acyclic diene monomer of 4 to 8 carbon atoms, said random copolymer having been produced by polymerizing said vinylaromatic monomer and said acyclic diene monomer in solution in the presence of a randomizing agent, wherein the total quantity of the butyl rubber and the solution formed random copolymer is 100 parts per hundred parts rubber, and

from 0.1 to 8 parts per hundred parts rubber of a vulcanizing agent selected from the group consisting of sulfur, tetramethylthiuram disulfide, dimorpholinyl disulfide, and dibutylxanthogen disulfide, and mixtures thereof.

4,104,335

DUSTLESS, FREE-FLOWING ULTRAVIOLET ABSORBING COMPOSITIONS FOR POLYOLEFINS

Leigh Cameron Allen, Bound Brook, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sep. 2, 1976, Ser. No. 719,796

Int. Cl.[2] C08K *5/36*

U.S. Cl. 260—897 A **7 Claims**

1. An essentially dustless, free-flowing light stabilizer composition for polyolefins comprising an intimate mixture of a nickel amine complex of a 2,2'thiobis(4-alkylphenol) and from about 1 to 10 percent by weight thereof of a low molecular weight polyethylene.

4. A composition stabilized against the deteriorative effects of ultraviolet radiation comprising a polymer of a mono-olefin and an effective stabilizing amount of the dustless light stabilizer composition of claim 1.

4,104,336

POLYETHYLENE MODIFIERS FOR HIGH NITRILE POLYMERS

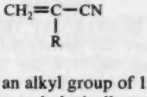
I. Luis Gomez, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 7, 1977, Ser. No. 774,885

Int. Cl.[2] C08L *23/06, 25/12, 33/18, 33/20*

U.S. Cl. 260—897 A **10 Claims**

1. A nitrile polymer composition comprising (a) from about 50 to about 90% by weight, based on total polymer weight calculated as acrylonitrile, of a polymerized nitrile monomer having the formula:



wherein R is hydrogen, an alkyl group of 1 to 4 carbon atoms or halogen, (b) one or more ethylenically unsaturated polymerized comonomer materials, and (c) from about 0.005 to about 2% by weight based on total polymer weight, of a low molecular weight polyethylene modifier.

4,104,337

MIXTURE FEED REGULATION DEVICE FOR AN INTERNAL-COMBUSTION ENGINE

Giampaolo Garcea, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Filed Jul. 27, 1977, Ser. No. 819,565

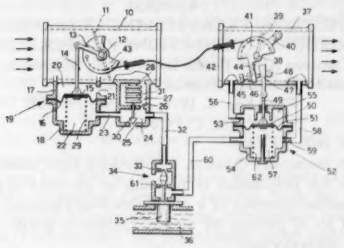
Claims priority, application Italy, Aug. 4, 1976, 26015 A/76

Int. Cl.[2] F02M *1/10*

U.S. Cl. 261—39 A **3 Claims**

1. A device for the regulation of the feed of mixture in an internal combustion engine when operating at high altitudes during the engine warm-up stage and the accelerator pedal release stage, characterized in that it comprises first valve

means arranged in the duct through which the air drawn by the engine flows upstream of the usual valve throttling means actuated by the driver through the accelerator pedal and arranged at the inlet of the feeding ducts of the engine, a first diaphragm capsule in which the diaphragm is mechanically linked to the first valve means aforesaid, a chamber in the capsule being in communication with the outside atmosphere, the other chamber of the capsule being in communication, through a calibrated port, with the duct through which air flows downstream of same first valve means and being also in communication with the outside atmosphere through a first variable-cross-section port as defined by valve means operatively connected to a member responsive to a pressure which is a function of the ambient pressure and through a second variable-cross-section port defined by valve means operatively connected to a member sensitive to the engine working temperature, resilient means in engagement with said diaphragm



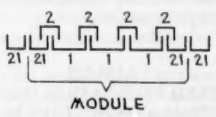
balancing the force due to the pressure differential on the diaphragm faces, the device further comprising stop means in engagement with said throttling value means, said stop means being capable of varying the end-of-stroke position of said usual throttling valve means, said stop means being mechanically linked to the diaphragm of a second diaphragm capsule, a chamber of the capsule being in communication with the duct through which air flows downstream of said first valve means, the other chamber of the capsule being in communication with at least an engine-feeding duct downstream of the usual feed-throttling means through a second calibrated port and being also in communication with the outside atmosphere through a third variable-cross-section port as defined by valve means operatively connected with a member responsive to the engine working temperature, resilient means in engagement with said diaphragm balancing the force originated by the pressure differential on the diaphragm faces.

4,104,338

BUBBLE CAP TRAY

Salvatore A. Guerrieri, 503 Beverly Rd., Newark, Del. 19711

Filed Apr. 30, 1976, Ser. No. 682,088
Int. Cl.[2] B01D *3/20*
U.S. Cl. 261—114 TC **4 Claims**



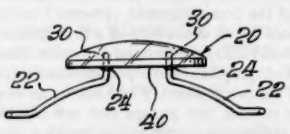
1. An improved liquid-vapor contacting bubble cap tray constructed of channels of two different widths and thicknesses, each channel having a cross section shaped approximately like a block U, the wider channels forming the tray floor and chimneys, being spaced from each other with the sides of channels pointing upward and the space between two adjacent troughs being closed at each end by an end closure whereby the combination of the sides of two adjacent channels and the two end closures form a long, low, narrow chimney; the narrower channels, with sides pointing downward, and with each end closed by said end closures, to form caps which are positioned over the chimneys, thereby providing a continuous vapor passage connecting the space below said channels with the space above them, said vapor passages being uniformly spaced across the diameter of the tower with their long axes parallel to each other, the improvement wherein said tray channels are thinner than said cap channels and said end closures have a modified U-shaped cross section, the outer extension of the sides of said U being at a greater distance from each other than inner extensions, said sides being formed by turning said inner extension first outwardly 90° and extending said sides outwardly for a distance and then turning said outward extension back 90° to form sides extending in the same direction as the inner extension of said sides but spaced at a greater distance from each other, the distance between the outside faces of the narrower portion of said closure being equal to the distance between adjacent tray channels, the distance between the outside faces of the wider portion of said closure being equal to the inside width of the cap channel, the height of said closure being equal to the distance between the bottom face of said tray channels and the inside top face of the cap channel, the ends of the tray channels, the cap channel and said closures being firmly attached to each other.

4,104,339

METHOD FOR THE MANUFACTURE OF INTRAOCULAR LENSES

James G. Fetz, 14930 E. Ramona Blvd., Baldwin Park, Calif. 91706, and Ronald P. Jensen, 540 N. Central Ave., Glendale, Calif. 91203

Filed Dec. 3, 1975, Ser. No. 637,321
Int. Cl.[2] B29D *11/00*; **A61F** *1/16, 1/24*
U.S. Cl. 264—1 **13 Claims**



1. A method for connecting an attachment to the material of a thermoplastic intraocular lens body, said attachment being comprised of a length of thin metal line or wire, the method comprising the steps of providing a thermoplastic intraocular lens body having a central area constituting an area of vision and a surrounding area outside said area of vision; providing an attachment in the form of a length of thin metal line or wire adapted to be attached to said lens body; positioning at least one end of the attachment internally of said lens remote from the outer periphery of said lens body and outside said area of vision, heating said material to its melting point only in the vicinity of said at least one end; said steps of positioning at least one end of the attachment internally of the lens body and of heating said material to its melting point being performed simultaneously, by applying heat to said metal attachment to raise its temperature and pushing said at least one end into the material of the lens body, whereby the material of the lens body in the vicinity only of the said at least one end is melted to permit positioning of said at least one end in said lens body and whereby upon cooling, said material forms a fused connection with said attachment.

10. A method for connecting an attachment to the material of a thermoplastic intraocular lens body, said attachment being comprised of a length of thin line or wire, the method comprising the steps of providing a thermoplastic intraocular lens body having a central area constituting an area of vision and a peripheral area outside said area of vision; providing an attachment in the form of a length of thin line or wire adapted to be attached to said lens body; positioning at least one end of the attachment internally of said lens body outside said area of

vision, heating said material to its melting point only in the vicinity of said at least one end; and allowing the melted material to cool, whereby to form a fused connection between said material and said attachment, the steps of positioning at least one end of the attachment internally of said lens body comprising drilling a pair of spaced holes into the anterior surface of said lens body along parallel paths spaced on opposite sides of and exterior to said area of vision and less than half way through said lens body and placing the two ends of the attachment into said holes; the heating of said material comprising the positioning of a heatable probe outside the base of said lens body in alignment with one of said ends positioned in one of said holes; heating said probe and moving it into and through the base of said lens body into contact with one of said two ends by melting the lens body material from the base through to said end and melting the material adjacent said end; removing said probe; repositioning said probe in alignment with the second of said ends positioned in the other of said holes; heating said probe and moving it into and through the base of said lens body into contact with said second end; and removing the probe and allowing the attachment and lens body to cool whereby to form a loop attachment having two ends fused to the material of the lens body.

4,104,340

METHOD OF MAKING STRUCTURAL MEMBER FROM PREPREG SHEET OF FUSIBLE RESIN MICROFIBERS AND HEAT-RESISTANT REINFORCING FIBERS

Gene R. Ward, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 544,192, Jan. 27, 1975, abandoned. This application Aug. 9, 1976, Ser. No. 712,834

Int. Cl.[2] B01J *2/04*

U.S. Cl. 264—6 **15 Claims**

1. Method of making a fiber-reinforced structural member comprising the steps of

(a) extruding at least one jet of liquefied resin, which fuses within the range of 50°–300° C, through a fine orifice into a high-velocity stream of gas where the extruded jet is attenuated, subdivided, and cooled to form a stream of randomly intermingled solid fusible microfibers having an average diameter of 0.1–25 micrometers;

(b) directing said stream of microfibers and at least one stream of reinforcing fibers which have an average length of at least 1 cm and do not fuse or degrade at or below the fusing temperature of the microfibers at a longitudinally moving porous screen so as to intermingle 12–98 volume-parts of said fusible microfibers and 2–80 volume-parts of said reinforcing fibers and form a composite open pliant prepreg sheet having a lofty surface quality enabling said sheet to conform to and cling to mold surfaces; said fusible microfibers extending to both surfaces of said formed sheet;

(c) removing said prepreg sheet from the porous screen;

(d) placing at least one layer of said prepreg sheet in a mold, to the surfaces of which said sheet clings;

(e) heating and pressing said prepreg sheet in said mold to fuse the microfibers to provide an essentially void-free matrix for the reinforcing fibers; and

(f) cooling said sheet and releasing the pressure to provide an essentially void-free structural member comprising reinforcing fibers in a matrix of the resin of the microfibers.

4,104,341

UTILIZATION OF CONSTITUENTS OF EFFLUENT FROM THE MANUFACTURE OF STYRENE BEAD POLYMERS IN THE MANUFACTURE OF FIBRIDS

Hans Georg Keppler, Weinheim; Bruno Sander; Rolf Moeller, both of Ludwigshafen; Eckhard Bonitz, Frankenthal, and Werner Simmler, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Apr. 6, 1976, Ser. No. 674,148

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1975, 2516562

Int. Cl.[2] B22D *23/08*

U.S. Cl. 264—9 **1 Claim**

1. A process for the manufacture of discrete fibrids from a macromolecular waste material contained in the aqueous phase effluent obtained form the bead polymerization of a styrene monomeric reactant after removal of the bead polymer, said polymerization having been carried out in the presence of a vinylpyrrolidone polymer or a vinyl alcohol polymer as a protective colloid also present in said effluent, which process comprises:

flocculating said macromolecular waste material in said aqueous phase effluent by carrying out one of the following steps,

(a) when said effluent contains said vinylpyrrolidone polymer, by adding per 100 parts of effluent about 0.05 to 5.0 parts of a water-soluble or water-dispersible high molecular weight compound containing at least 10 percent by weight of polymerized acrylic acid units, or the alkali metal or ammonium salts thereof, and reducing the pH below 3 by adding an inorganic acid, or

(b) when said effluent contains said vinylpyrrolidone polymer or said vinyl alcohol polymer, by heating the effluent in the presence of from about 0.02 to 5 percent by weight of sodium persulfate, potassium persulfate or ammonium persulfate;

separating the resulting flocculated macromolecular waste material from the effluent as a solid product;

dissolving or finely dispersing the waste material obtained as the solid product in an organic solvent selected from the group consisting of tetrahydrofuran and 1,4-dioxane; and

introducing the resulting solution or dispersion into water as a fluid precipitation medium to precipitate the waste material under shearing forces applied thereto sufficiently to produce fibrids having a specific surface area of from 10 to 30 m^2/g, a freeness of from 15 to 30° SR, a length of from 0.5 to 20 mm and a thickness of from 1 to 10 μ.

4,104,342

METHOD FOR MAKING METAL POWDER OF LOW OXYGEN CONTENT

Otto Wessel, Duisburg; Georg Hofmann, Krefeld; Hartmut Gesell, and Werner Scholz, both of Duisburg, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Aug. 29, 1972, Ser. No. 284,504

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1971, 2144220

Int. Cl.[2] B01J *2/16*

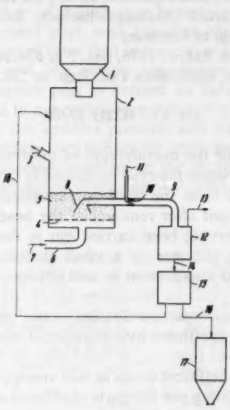
U.S. Cl. 264—12 **13 Claims**

1. In a method of producing metal powder by means of atomizing a stream of molten metal through a pressurized gas, wherein the resulting metal droplets upon solidifying fall as particles in a vessel towards the bottom of the vessel, in which the atomization takes place, the improvement comprising the steps of:

(a) providing a cooling powder to the vessel, the powder having temperature below the melting point of the metal;

(b) feeding a gas into the vessel near the bottom thereof and including blowing the gas in an upward direction for blowing the cooling powder also in an upward direction to form a fluidized bed, the falling metal particles as inter-

cepting the upwardly blown cooling powder is intimately mixed with said cooling powder for obtaining a mixture of metal particles and cooling powder whirling together in the fluidized bed, wherein said metal particles are cooled and solidified by the cooling powder;



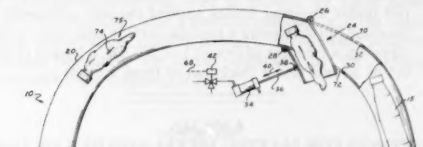
(c) extracting a portion of the mixture of solidified metal particles and cooling powder from the fluidized bed in the vessel by maintaining an extracting gas flow from the vessel carrying along metal particles and cooling powder as mixed together and out of the vessel.

4,104,343

DETECTING AND SORTING ABNORMAL ARTICLES DURING BLOW MOLDING

Harry C. Cornelius, East Granby, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 4, 1977, Ser. No. 774,618
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—40.1 **8 Claims**



1. In the process of blow molding hollow articles which includes the step of:

distending precursors of thermoplastic material at molding temperature within the cavity of a blow mold with fluid under pressure while venting residual air within said cavity to the exterior of said mold;

the improvement which comprises, in combination:

sensing a variation in pressure of said fluid outside a predetermined limit upstream of the mold during said distending when an abnormal article of unacceptable quality is formed in said cavity from one of such precursors; and

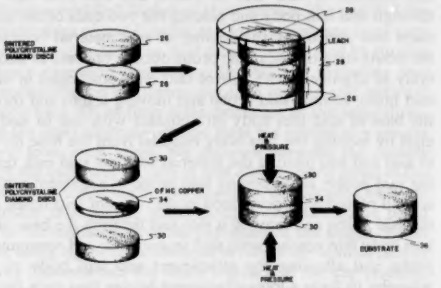
creating a signal in response to said variation to isolate said abnormal article from those of acceptable quality.

4,104,344

HIGH THERMAL CONDUCTIVITY SUBSTRATE

Bill J. Pope; M. Duane Horton, and H. Tracy Hall, all of Provo, Utah, assignors to Brigham Young University, Provo, Utah

Filed Sep. 12, 1975, Ser. No. 612,603
Int. Cl.[2] C04B *35/52*
U.S. Cl. 264—42 **3 Claims**



1. A method of treating a polycrystalline diamond composite so as to make a high thermal conductivity substrate usable as a heat sink, the method comprising the steps of:

preparing at least one sintered polycrystalline diamond composite;

leaching the composite to remove non-diamond carbon;

placing a selected quantity of material having known electrical conductivity characteristics in contact with the leached composite; and

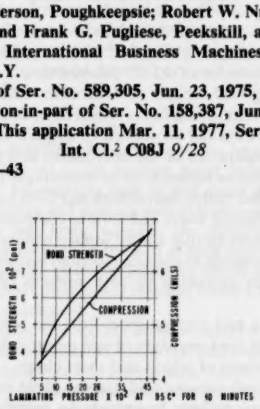
infusing the selected quantity of material of known electrical conductivity characteristics such that the material is infiltrated into the leached composite by subjecting both the leached composite and the material to pressure and temperature conditions under which conversion of diamond to graphite will be minimized while at the same time maintaining the material in a molten state until it is perfused sufficiently into the leached composite, thereby forming a unitary substrate having both (1) high thermal conductivity properties and (2) selected electrical conductivity properties which enable use of the substrate as a heat sink.

4,104,345

CERAMIC DIELECTRICS

Leslie C. Anderson, Poughkeepsie; Robert W. Nufer, Hopewell Junction, and Frank G. Pugliese, Peekskill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 589,305, Jun. 23, 1975, which is a continuation-in-part of Ser. No. 158,387, Jun. 30, 1971, abandoned. This application Mar. 11, 1977, Ser. No. 776,815
Int. Cl.[2] C08J *9/28*
U.S. Cl. 264—43 **26 Claims**



1. A thermoplastic resin composition adapted for forming ceramic slips comprising:

(A) a solvent soluble thermoplastic organic resin dissolved in a

(B) volatile organic solvent mixture completely miscible with said resin and comprising a first solvent fraction and a asolvent fraction, with

(a) said first solvent fraction constituting a complete solvent for said resin,

(b) said asolvent fraction providing a maximum solubility of 5% for said resin therein,

(c) the ratio of the evaporation rates of said first solvent fraction to said asolvent fraction being at least two, and

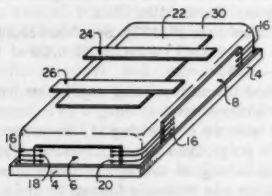
(d) the ratio, in parts by weight in said mixture, of said first solvent fraction to said asolvent fraction being less than said evaporation rate ratio.

4,104,346

PROCESS FOR MOLDING A SUBSTANTIALLY ISOTROPIC ISOCYANATE-BASED POLYMER FOAM BUN

John N. Curtiss, Seabrook; Charles E. Koehler, Baytown, and Pat L. Murray, Dayton, all of Tex., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 29, 1976, Ser. No. 709,777
Int. Cl.[2] B29D *27/04*
U.S. Cl. 264—51 **10 Claims**



1. In a process for molding a substantially isotropic isocyanate-based polymer foam bun by charging an isocyanate-based polymer foam forming mixture to a box mold, the improvement which comprises charging said foam forming mixture to a mold having

(i) a floor,

(ii) sidewalls of which at least one oppositely disposed pair is adapted to slide laterally outwards on said floor, said sidewalls being held in initially abutting relationship by extensible coupling means, and

(iii) stop means provided on said floor of said mold to limit the outward movement of such of said sidewalls as are adapted to slide laterally;

the amount of foam forming mixture so charged being in excess of the amount which, after expansion under free rise conditions, is necessary to fill said mold cavity in unexpanded condition of the latter;

closing said mold by means of a cover slidably mounted on, but not attached to, the upper edges of said sidewalls;

permitting said laterally slidable sidewalls to be pushed outwardly towards said stop means when the lateral pressure exerted by the rising foam exceeds the restraining pressure exerted by said extensible coupling means; and

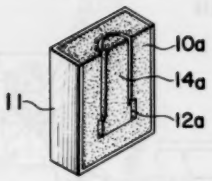
permitting said mold cover to float freely on the upper surface of said rising foam after the latter contacts the underside of said cover.

4,104,347

METHOD OF MAKING A SAND MOLD

Yoshinobu Ohashi, Nishinomiya, and Shizuo Inoue, Amagasaki, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Nov. 17, 1975, Ser. No. 632,720
Claims priority, application Japan, Nov. 19, 1974, 49-134772; Nov. 19, 1974, 49-142294[U]; Feb. 18, 1975, 50-20596
Int. Cl.[2] C04B *35/14*
U.S. Cl. 264—113 **1 Claim**



1. A method of making a sand mold having a part molding cavity and a core for casting an annular part between the portion defining said part molding cavity and said core, comprising:

(a) forming a mixture of sand having a particle size of 200–400 microns and a self-hardening binder therefor;

(b) placing a sufficient amount of said mixture in a mold jacket to fill said mold jacket;

(c) pressing and forming said mixture in said mold jacket into a block having at least one surface a portion of which is a substantially planar;

(d) relieving said block of said pressure;

(e) allowing said block to stand to permit said binder to partially cure to give said block a predetermined compressive strength of from 2–10 kg/cm^2 which is less than the ultimate compressive strength when said binder is fully cured;

(f) bringing into contact with said portion of said surface the cutter element of a rotating blade assembly to cut said block and moving the peripheral surface of said cutter element which trails, relative to the direction of movement of said blade assembly, the portion of the cutter element which carries out the cutting action along the surface exposed by the cutting for exerting a compressive force on the exposed surface;

(g) moving said blade assembly in a plane transverse to said block planar surface while said blade assembly continues cutting in said block a core molding cavity corresponding to the shape of a core for at least part of the part to be cast;

(h) applying a coating of a parting agent to the exposed surface of said core molding cavity;

(i) placing an additional amount of said mixture in said core molding cavity to fill said core molding cavity;

(j) pressing and forming said mixture in said core molding cavity into a core member corresponding to the shape of the core molding cavity;

(k) relieving said core member of said pressure;

(l) removing said core member from said core molding cavity;

(m) again carrying out the steps (f) and (g) for further cutting the exposed surface of said block in said core forming cavity to form in said block the part molding cavity; and

(n) placing said core member in said part molding cavity as at least part of the core for the annular part prior to casting the annular part.

4,104,348

METHOD AND APPARATUS FOR FILLING MOLDS

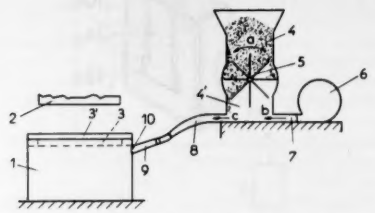
Edmund Munk; Herbert Haas, and Gerd Weinberg, all of Oberstenfeld, Fed. Rep. of Germany, assignors to Werzalit-Pressholzwerk J.F. Werz Jr. KG, Oberstenfeld, Fed. Rep. of Germany

Continuation of Ser. No. 337,217, Mar. 1, 1973, which is a division of Ser. No. 78,959, Oct. 7, 1970, which is a continuation of Ser. No. 655,024, Jul. 21, 1967. This application May 21, 1976, Ser. No. 688,919

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1966, 49820

Int. Cl.[2] B29C *5/06*

U.S. Cl. 264—121 **5 Claims**



1. A method of filling a mold with fibrous material and pressure molding the material in the mold, said method comprising the steps of providing a female mold having a cavity having an open end and an inlet port extending transverse to said open end and communicating with the cavity adjacent said open end; placing across said open end a screening device having an inner surface facing the interior of said cavity and having a predetermined configuration; feeding into a stationary chamber spaced from said mold a stream of the fibrous material in a first direction while passing a stream of gas in a second direction transverse to said first direction through the stream of fibrous material so that the fibrous material is entrained by said gas stream; blowing said stream of gas with said fibrous material entrained therein through said inlet port into the cavity of said mold substantially parallel to and adjacent the screening device while venting the gas through said screening device thus retaining the fibrous material in said cavity for uniformly charging the same; terminating admission of the stream of gas with the fibrous material entrained therein when the cavity is fully charged; closing said port; removing said screening device; and applying a male plunger of a configuration corresponding to said predetermined configuration through said open end of said cavity to thereby pressure mold the fibrous material in said mold.

4,104,349

METHOD OF MAKING A PERFORATED, MOLDED CONTAINER

David E. Hillgenberg, 551 W. Parkwood Ave., La Habra, Calif. 90631

Filed Feb. 4, 1976, Ser. No. 655,667

Int. Cl.[2] B29C *17/03, 17/10*

U.S. Cl. 264—153 **9 Claims**

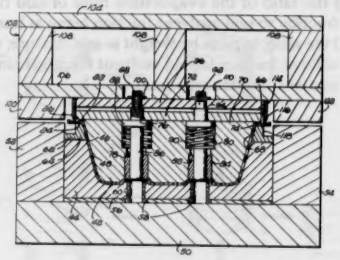
1. In the molding of a container by forming a softened sheet of organic polymer material between male and female mold parts in which said sheet is disposed over a female die surface arranged on said female mold part to define the side and bottom walls of said container and said male mold part includes a male die surface arranged to close with said female mold part, the improvement for forming a peripheral lip entirely around the top edge of said container, sand improvement comprising:

providing an annular region on said female die surface for defining a peripheral lip of said container;

slidably disposing a blade of steel entirely around said male mold part said blade being formed with serrates pointing downwardly and closely adjacent the outer edge of said male mold parts;

moving said mold parts together to form said container; and

thereafter sliding said blade downwardly so that said serrates tear through said sheet of organic material to define the outer edge of said lip,



molding said container bottom so as to form at least one platform region displaced inwardly from surrounding portions of the container bottom and perforating said at least one platform region while said material is between said male and female mold parts by moving a punch member relative said mold parts and through said platform regions.

4,104,350

PROCESS FOR ENCAPSULATING OBJECTS AND FOR FORMING FLEXIBLE MOLDS

Richard C. Doss, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 23, 1975, Ser. No. 616,092

Int. Cl.[2] B29C *1/02, 6/02*

U.S. Cl. 264—225 **7 Claims**

1. A method of encapsulating regular or irregular shaped objects which comprises:

forming a mixture comprising (1) an uncured or partially cured poly(oxyalkylene)-polyester-poly(monosulfide)-polythiol having an average of more than two pendent thiol groups per molecule formed by reacting (a) at least one mercaptoalkanoic acid, (b) at least one thiodialkanoic acid, and (c) at least one poly(oxyalkylene)-polyol containing an average of more than two pendent hydroxyl groups per molecule and a molecular weight in the range 200–20,000; and (2) a curing agent selected from metallic oxides, organic peroxides, organic hydroperoxides, metallic salts of carboxylic acid, ammonium persulfate, sulfur, metal chromates, and dichromates which is present in an amount sufficient to convert at least about 70 percent of the pendent thiol groups to polysulfide groups;

immersing the desired object in said uncured or partially cured mixture; and

allowing said mixture containing said object immersed therein to cure and form a solid mass encapsulating said object.

4. A method of producing molds and molding regular or irregular shaped objects which comprises:

forming a mixture comprising (1) an uncured or partially cured poly(oxyalkylene)-polyester-poly(monosulfide)-polythiol having an average of more than two pendent thiol groups per molecule formed by reacting (a) at least one mercaptoalkanoic acid, (b) at least one thiodialkanoic acid, and (c) at least on poly(oxyalkylene)-polythiol containing an average of more than two pendent hydroxyl groups per molecule and a molecular weight in the range 200–20,000; and (2) a curing agent selected from metallic oxides, organic peroxides, organic hydroperoxides, metallic salts of carboxylic acid, ammonium persulfate, sulfur, metal chromates, and dichromates which is present in an

amount sufficient to convert at least about 70 percent of the pendent thiol groups to polysulfide groups;

immersing a replica of the desired object in said uncured or partially cured mixture;

allowing said mixture containing said object immersed therein to cure by heating at a temperature in the range of about −20° C to about 100° C for a time ranging from about one minute to about 24 hours to form a solid mass encapsulating said object;

removing the object from the solid mass of cured formulation, leaving a mold having a cavity of desired size, shape, and proportion in which a regular or irregular shaped object can be molded;

filling the cavity with a moldable material and allowing same to form the desired object within said cavity conforming to the shape of said cavity; and

removing said desired object from said cavity.

4,104,351
PROCESS FOR SHAPING LOW DUROMETER SILOXANE ELASTOMERS CONTAINING POLYTETRAFLUOROETHYLENE POWDER

John D. Blizzard, and Carl M. Monroe, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 591,906, Jun. 30, 1975, abandoned. This application Jun. 3, 1976, Ser. No. 692,614

Int. Cl.[2] **B29C** *25/00*

U.S. Cl. 264—236 **4 Claims**

1. A method of preparing a low durometer elastomeric article comprising:

(i) preparing a composition by mixing components consisting essentially of

(a) 100 parts by weight of a polydiorganosiloxane gum having a Williams plasticity of from 0.040 to 0.100 inches and having an average of from 1.999 to 2.001 organic radicals per silicon atom, at least 95 percent of the organic radical being methyl, any remaining organic radical being selected from the groups consisting of 3,3,3-trifluoropropyl and monovalent hydrocarbon radicals having from 1 to 6 carbon atoms, no more than 0.1 percent of all organic radicals in (a) having aliphatic unsaturation, said gum being endblocked with radicals selected from the group consisting of silicon-bonded hydroxyl radicals and silicon-bonded vinyl radicals,

(b) from 15 to 25 parts by weight of a reinforcing silica filler having a surface area of at least 50 square meters per gram,

(c) from 0.3 to 1.0 parts by weight, for every 100 parts by weight of the total of (a) and (b) of a polytetrafluoroethylene powder having an average particle diameter of less than 1,000 microns and,

(d) from 0.3 to 2.0 percent by weight, based on the total weight of said composition of an organic peroxide curing agent,

(ii) extruding said composition to form a desired article,

(iii) heating said article at an elevated temperature to cure said composition and,

(iv) recovering the cured article of (iii) as an elastomeric article characterized by a durometer of less than 30 and reduced porosity.

4,104,352
METHOD OF MAKING A BOWLING PIN

Wesley W. Morgan, San Antonio, and Frank E. Davis, Arlington, both of Tex., assignors to Columbia Industries, Inc., San Antonio, Tex.

Division of Ser. No. 425,327, Dec. 17, 1973, abandoned. This application Mar. 30, 1977, Ser. No. 782,901

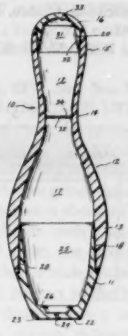
Int. Cl.[2] **B29C** *5/00;* **B29D** *9/00;* **B29G** *1/00*

U.S. Cl. 264—250 **8 Claims**

1. The method for forming a plastics body having a cavity therein comprising:

predetermined quantities of at least first and second thermosetting molding materials are preliminary shaped in at least one mold to form at least one rough molding, said materials being adapted to form portions of the final product having different hardness characteristics.

placing said at least one rough molding in a mold cavity of a finishing mold having a desired shape,



thereafter inserting at least one mandrel into said mold cavity and into said at least first and second materials so as to at least partially mix adjacent portions of said materials, and

curing said materials with heat thereby forming said body, and removing said at least one mandrel from said body and said body from said finishing mold.

4,104,353
METHOD OF INJECTION MOULDING OF ARTICLES OF SEVERAL MATERIALS

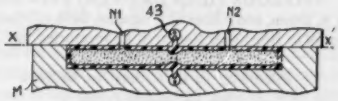
Bernard Leon Monnet, Bellignat, France, assignor to Billion S.A., Oyonnax, France

Division of Ser. No. 508,568, Sep. 23, 1974, Pat. No. 4,029,454. This application Apr. 5, 1976, Ser. No. 673,940

Claims priority, application France, Sep. 25, 1973, 73 34327

Int. Cl.[2] **B29D** *27/00*

U.S. Cl. 264—255 **12 Claims**



1. A method of injection molding of complex articles of large size, having at least locally, composite portions comprised of at least two materials of different compositions, one of which is coated by the other, the injection of the materials forming said composite portions being effected in at least two different zones of the mold cavity, said method comprising the steps of:

injecting into each said zone of the mold cavity a mass of a moldable first material,

injecting into each mass of first material a mass of a moldable second material which pushes said first material against the walls of said mold cavity and toward the first material in the other zone of the mold cavity whereby the masses of the first material form a junction, and

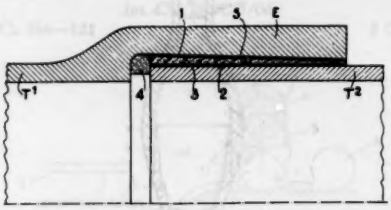
evacuating adjacent the junction of the masses of said first material a quantity of the first material situated between said masses of said second material to enable the two masses of said second material to join and mix together to form a homogeneous core of second material in said composite portion.

4,104,354

METHOD FOR ASSEMBLING BY ADHESION WITH SYNTHETIC RESINS

Donald Arthur Hubbard, Cambridge, England, assignor to Pont-A-Mousson S.A., Pont-A-Mousson, France

Continuation of Ser. No. 426,733, Dec. 20, 1973, abandoned.
This application Aug. 2, 1976, Ser. No. 710,943
Claims priority, application France, Dec. 29, 1972, 7246885; Oct. 26, 1973, 73 38341
Int. Cl.[2] B29C *27/00*; B29G *7/00*
U.S. Cl. 264—262 23 Claims



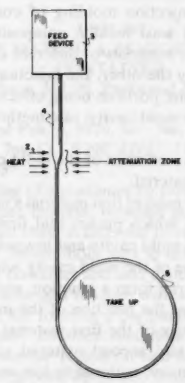
1. A method for assembling two planar parts at surrounding temperature with no necessity to apply heat comprising applying on a surface of each the parts to be assembled a thin layer of a polymerizable first mixture at surrounding temperature and containing a first resin which polymerizes slowly at surrounding temperature and is slightly exothermic as it polymerizes and has a good adherence to said surfaces while allowing a space between said thin layers in the desired and final position of said parts, and thereafter introducing in said space between the layers, before the first resin has substantially polymerized, a polymerizable second mixture at surrounding temperature and containing a second resin which polymerizes more rapidly at surrounding temperature than said first resin and has a good adherence to the first resin and is sufficiently exothermic as it polymerizes to accelerate the polymerization of the first resin, said method including a step of adding a filler between the layers of said first mixture before said second mixture is introduced by injecting the second mixture in said filler and in said space.

4,104,355

VITREOUS FIBER DRAWING PROCESS

Stanley A. Dunn, and Elmer G. Paquette, both of Madison, Wis., assignors to Bjorksten Research Laboratories, Inc., Madison, Wis.

Filed May 3, 1976, Ser. No. 682,444
Int. Cl.[2] B29C *17/02*
U.S. Cl. 264—290 R 6 Claims



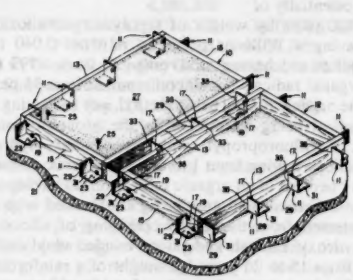
1. The process of drawing an inviscid melt spun fiber having a composition consisting essentially of at least one nonnetwork forming refractory metal oxide, said composition characterized by melting at a relatively high temperature so that it has a solidus point or melting point in excess of 1300° C., said process characterized by drawing at a temperature significantly below said temperature at which said composition melts so that all temperatures in the heated zone within which the fiber undergoes attenuation are substantially below the said solidus point or melting point of said composition, so as to produce controlled devitrification.

4,104,356

TILT-UP PANEL BRACKET

Joseph Paul Deutsch, 21 Almond Tree La., Irvine, Calif. 92664, and Ray A. Jones, 9760 Lemon Ave., Alta Loma, Calif. 91701

Filed Jan. 26, 1977, Ser. No. 762,602
Int. Cl.[2] E04B *1/40*
U.S. Cl. 264—297 5 Claims



1. A method of forming a tilt-up, concrete wall panel, comprising:

aligning wood form members on a horizontal slab of set concrete to define the length and width of a tilt-up concrete wall panel, said panel being shorter and narrower than said slab;

placing a plurality of angle iron members in abutment with the exterior surfaces of said wood form members, each of said angle iron members having a horizontal and vertical leg each of which abuts said wood form members, said angle iron members oriented so that said vertical leg extends outwardly from the adjacent wood form member in a plane perpendicular thereto;

driving a nail through a pilot hole in a tab provided on one of said vertical and horizontal legs of each of said angle iron members into said wood form members;

attaching said horizontal leg of each of said angle iron members to said horizontal slab using easily removable attachment means;

pouring concrete into the form provided by said wood form members to form a tilt-up wall section; and

after said tilt-up wall section has cured, removing said wood form members by removing said angle iron members, said nails, and the means attaching said horizontal leg of said angle iron members in one operation by jarring said angle iron members away from said horizontal slab of concrete.

4,104,357

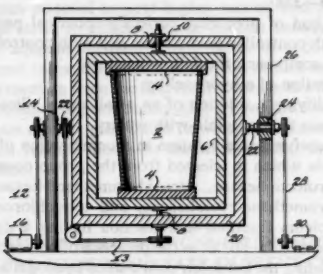
METHOD OF ROTATIONAL MOLDING ABOUT PLURAL AXES AT LOW ROTATIONAL SPEEDS

Edgar Allan Blair, Princeton, N.J., assignor to Monster Molding, Inc., Hingham, Mass.

Continuation-in-part of Ser. No. 322,457, Jan. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 105,099, Jan. 8, 1971, abandoned. This application May 17, 1974, Ser. No. 471,124

Int. Cl.[2] B29C *5/04;* B29D *3/02*

U.S. Cl. 264—255 32 Claims



1. A process for low rotational velocity molding at a temperature of less than 100° C of a shape comprising the successive steps of:

(a) mixing a liquid thermosetting polymer or a liquid polymer with a curing agent capable of hardening said thermosetting polymer or pre-polymer at ambient temperatures, and placing the resulting liquid mixture into a mold;

(b) moving said mold, said moving consisting of rotating said mold about two axes at such low rotational velocity, at ambient temperatures such that the centrifugal force on said mixture is negligible and adjusting the rotational velocity about each axis such that, upon observation, a uniform distribution of said polymer is obtained;

(c) maintaining the polymer while thus rotating said mold substantially under gravitational force influence with respect to said axes causing said mixture to distribute uniformly over and to coat the walls of said mold taking the form thereof without accumulation of said polymer due to centrifugal force;

(d) continuing said rotation until said liquid mixture hardens to a solid shape; and

(e) removing the solid shape thus produced from said mold.

4,104,358

SELECTIVE EXTRACTION OF YTTRIUM IONS

Yukinori Minagawa, Yokohama; Tsugio Kaneko; Fumikazu Yajima, both of Tokyo; Kunihiko Yamaguchi, Yokohama, and Toshihiko Yoshitomi, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

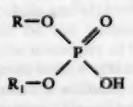
Filed Jun. 7, 1977, Ser. No. 804,465

Claims priority, application Japan, Jun. 11, 1976, 51-68332

Int. Cl.[2] C01F *17/00*

U.S. Cl. 423—21 7 Claims

1. A method for selectively extracting yttrium ions which comprises contacting an aqueous solution containing diethylenetriaminepentaacetic acid, yttrium ions, and one or more heavy rare earth (atomic number 64 to 71) ions, and having an initial pH of from 6 to 9, with a phosphoric acid ester having the formula



wherein R is a C_4 - C_{18} aliphatic hydrocarbon group or aryl group, and R_1 is a C_4–C_{18} aliphatic hydrocarbon group, aryl group, or hydrogen atom.

4,104,359

REGENERATION OF ORGANIC EXTRACTANTS CONTAINING α-HYDROXYOXIMES

Phillip K. Davis, Boise, Id.; Helen S. Leaver, Denver, Colo., and Henry Freiser, Tucson, Ariz., assignors to Amax Inc., Greenwich, Conn.

Filed Feb. 28, 1977, Ser. No. 772,559

Int. Cl.[2] C01G *51/00, 53/00;* C07C *131/14*

U.S. Cl. 423—139 1 Claim

1. A process for extracting at least one metal selected from the group consisting of cobalt and nickel from an acidic aqueous process solution which comprises maintaining the process solution at a temperature between about 10° C and about 40° C; contacting the process solution with a liquid extractant of at least one oxime selected from the group consisting of α-hydroxyoximes or a ketoxime which ketoxime has its oxime in the anticonfiguration with respect to the hydroxyl group and at least one sulfonic acid dissolved in a water immiscible organic solvent to load the organic extractant with the metal value; stripping the metal value from the loaded extractant with a concentrated aqueous solution of an inorganic acid to regenerate the organic extractant, recycling the regenerated extractant to the metal loading step and regenerating the organic extractant when its capacity falls below about 90% of its original capacity by reacting the organic extractant with a salt of a hydroxylamine.

4,104,360

PROCESS FOR REDUCING OXIDES NITROGEN IN THE EXHAUST GAS FROM INTERNAL COMBUSTION ENGINES

Garbis H. Meguerian, Olympia Fields, and Frederick W. Rakowsky, Naperville, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 329,898, Feb. 5, 1973, abandoned, which is a continuation-in-part of Ser. No. 104,214, Jan. 6, 1971, abandoned. This application Apr. 16, 1975, Ser. No. 568,469

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—213.2 35 Claims

1. A process for reducing nitrogen oxides in an exhaust gas obtained from the combustion of hydrocarbon materials, which process comprises the step of passing said nitrogen oxides through a zone maintained at conditions at which said nitrogen oxides will be reduced, said zone including a substantially rigid catalytic member of a metal support or substrate plated with one or more members selected from the group consisting of copper, nickel, iron, and chromium and having, at least in part, an oxidized surface that catalytically promotes the reduction of said nitrogen oxides as they pass through said zone, said catalytic member having a reticulated structure and said metal support or substrate being a tough, strong metal or metal alloy having a melting point in excess of about 2,000° F., and said catalyst being prepared by the method comprising the steps of: (a) plating the surface of said support or substrate with one or more layers of one or more of said members to form a plated support or substrate, (b) heating in an inert atmosphere said plated support or substrate so that the atoms on the surfaces of said members interdiffuse with themselves and with surface atoms of said support or substrate, and (c) exposing said plated support or substrate to an oxygen-containing atmosphere in the presence or absence of moisture and at a temperature of about 1,200° F. to about 1,600° F. to oxidize, at least in part, the atoms at or near the surface of said plated support or substrate to form thereat oxides of said members.

4,104,361

CATALYST FOR REDUCTION OF NITROGEN OXIDES AND PROCESS FOR PREPARING THE SAME

Eiichiroh Nishikawa; Takuji Itoh; Tsugio Maeshima, and Setsuo Kamiyama, all of Ohi, Japan, assignors to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 668,608, Mar. 19, 1976, Pat. No. 4,052,337. This application Apr. 6, 1977, Ser. No. 784,959
Claims priority, application Japan, Mar. 28, 1975, 50-37676
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—239 12 Claims

1. A process for treating a gaseous mixture comprising nitrogen oxides and oxygen in order to reduce the nitrogen oxides content thereof which comprises contacting said gaseous mixture and ammonia with a catalyst comprising at least one base metal component impregnated on a synthetic zeolite which has been ion exchanged with at least one alkaline earth metal ion to ion exchange the alkali metal in the zeolite so that the alkali metal content remaining is within the range from 0.2 to 0.6 equivalents per gram atom of aluminum, said contacting conducted at a temperature of from about 200° to 500° C.

4,104,362

PROCESS FOR THE MANUFACTURE OF AMMONIUM POLYPHOSPHATE

Heinrich Hahn, Gladbeck; Hans Heumann, Herne; Heinz Liebing, Wanne-Eickel; Manfred Schweppe, and Walter Hilt, both of Herne, all of Fed. Rep. of Germany, assignors to Veba-Chemie Aktiengesellschaft, Gelsenkirchen-Buer, Fed. Rep. of Germany

Continuation of Ser. No. 429,311, Dec. 28, 1973, abandoned. This application Mar. 22, 1976, Ser. No. 669,416
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1972, 2264306
Int. Cl.[2] C01B *15/16, 25/26*
U.S. Cl. 423—315 10 Claims

1. A process for the continuous preparation of ammonium polyphosphate which comprises:

A. Continuously passing crude or pure wet process phosphoric acid containing solids having a phosphoric acid concentration, calculated as P_2O_5, of 28 to 32 weight percent, in the form of a falling film downwardly within at least one fall tube of a falling film reactor;

B. Continuously evaporating water from said wet process phosphoric acid or the resultant polyphosphate solution and continuously condensing phosphate therein to form polyphosphate while;

C. Continuously introducing gaseous ammonia upwardly through said fall tube in counter-current flow to the downwardly falling film of crude wet process phosphoric acid, the ammonia being present in a molar excess such as to form a product whose NH_3:P_2O_5 is between 0.5 and 4.5:1;

D. Continuously maintaining the temperature in the fall tube reaction zone in the range of 120° to 260° C such that the temperature is higher at the lower region of the fall tube than it is thereabove; and

E. Continuously adjusting the pH of the resultant ammonium phosphate solution by evaporation of water therefrom so that an aqueous solution containing 10% by weight sample has a pH between 2.5 and 6.0, said evaporation being affected employing the heat of neutralization generated by the reaction of the crude wet process phosphoric acid with the gaseous ammonia.

4,104,363

METHOD FOR PREPARATION OF PERFECTLY SPHERICAL PARTICLES OF SILICAGEL WITH CONTROLLED SIZE AND CONTROLLED PORE DIMENSIONS

Stanislav Vozka; Pavel Špaček, and Miroslav Kubín, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Jul. 23, 1976, Ser. No. 708,044
Claims priority, application Czechoslovakia, Jul. 25, 1975, 5256-75
Int. Cl.[2] C01B *33/16*
U.S. Cl. 423—338 2 Claims

1. A method of preparing perfectly spherical particles of silicagel with controlled particle size and with controlled pore dimensions comprising the following steps:

A. preparation of a hydrogel by:
(1) acidifying a solution of an alkali metal silicate by an organic acid miscible with water;
(2) emulsifying said solution in a combination of organic liquids which is selected from the group consisting of chloroform-hexane, tetrachloromethane-hexane, tetrachloromethane-cyclohexane, and tetrachloromethane-petroleum fraction; said fraction having a distillation range of 60° – 80° C. in the presence of octadecylamine;
(3) agitating the emulsion until a silica hydrogel is formed;

B. preliminary hardening of said hydrogel by heating above 100° C. a suspension of the hydrogel in a liquid boiling above 100° C., said liquid being selected from the group consisting of amyl acetate, dibutyl sebacate, glycol, glycerol, and phosphoric acid;

C. hydrothermal processing of the hardened hydrogel by heating same with water in an autoclave at 150° C. to 300° C. at a pressure corresponding to the vapor pressure of water at the temperature used; and

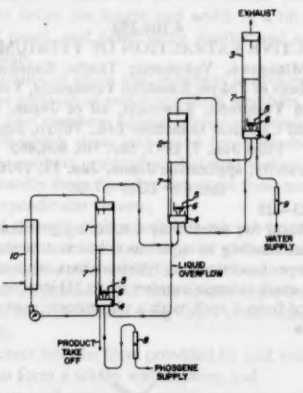
D. final hardening of the gel by:
(1) heating of the gel at 300° – 900° C.;
(2) boiling the gel in water; and
(3) repeating steps D(1) and (2) three times.

4,104,364

METHOD FOR HYDROLYZING PHOSGENE

Herman F. Hildebrandt, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 5, 1977, Ser. No. 812,546
Int. Cl.[2] C01B *7/08*
U.S. Cl. 423—481 5 Claims



1. A process for directly hydrolyzing phosgene with water as the sole reactant to produce a commercially useful hydrochloric acid product by insuring intimate contact between the phosgene and water through use of a porous material as a

reactant surface consisting essentially of the steps of providing contacting means containing a porous material submerged in an aqueous medium within each of three reactor means connected in series at staggered column heights and subsequently passing the phosgene through the porous material submerged in an aqueous medium within the lowermost first reactor means to effect intimate contact between phosgene and the aqueous medium at the porous material interface to thereby achieve the solution and subsequent hydrolysis of phosgene to commercially useful hydrochloric acid and carbon dioxide gas, subsequently passing unhydrolyzed phosgene and carbon dioxide in the exhaust from said first reactor means in turn through the porous material in next higher second and third reactor means in series to effect intimate contact between phosgene and the aqueous medium which flows in a countercurrent downward cascade to the first reactor means, removing the aqueous medium from the first reactor means as a hydrochloric acid product of approximately 33% by weight, and exhausting the carbon dioxide gas, which flows upward from said lowermost first reactor means to the third reactor means, to the atmosphere.

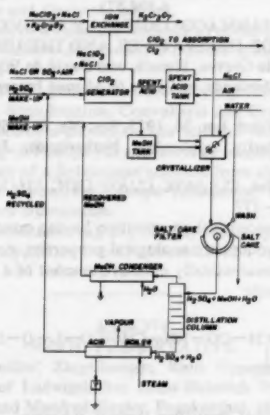
4,104,365
METHOD OF SEPARATING SULFURIC ACID FROM NEUTRAL SODIUM SULFATE IN SPENT CHLORINE DIOXIDE GENERATOR LIQUOR

John Howard, 5788 Olympic St., Vancouver, British Columbia, and Derek Gordon Lobley, 18775-54th Ave., R.R. 3, Surrey, British Columbia, both of Canada

Continuation-in-part of Ser. No. 690,373, May 27, 1976, abandoned. This application May 9, 1977, Ser. No. 794,740

Int. Cl.[2] C01B *17/90*; C01D *15/06*

U.S. Cl. 423—531 **5 Claims**



1. A method of separating sulfuric acid and anhydrous sodium sulfate from the effluent of a chlorine dioxide generator said effluent containing sulfuric acid, sodium sulfate, water, dissolved gases and multivalent cations, the method comprising:

removing the multivalent cations from the effluent;

oxidizing the residual chlorate in the effluent to chlorine dioxide and venting the chlorine dioxide;

purging dissolved gases from the effluent;

subjecting the purged effluent to high shear agitation while continually adding a mixture of an organic compound selected from alcohols and ketones with 5% to 50% water by volume, based on the volume of the organic compound, to adjust the normality of the effluent with respect to sulfuric acid to at most 4 and to precipitate anhydrous sodium sulfate from the effluent;

passing the mother liquor from the sulfate separation to a distillation column;

separating the organic compound from the distillate; and

recovering sulfuric acid from the still bottoms.

4,104,366
COMPOSITIONS FOR PREPARATION OF AQUEOUS SOLUTIONS OF LOW VALENCE ^{99}TECHNITIUM SALTS

Manfred Schmidt-Dunker, and Wolfgang Greb, both of Düsseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Sep. 23, 1976, Ser. No. 725,883

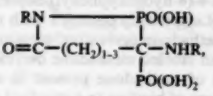
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1975, 2543349

Int. Cl.[2] A61K *29/00, 43/00*

U.S. Cl. 424—1 **12 Claims**

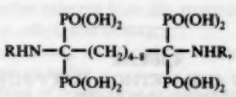
1. A composition for use in the preparation of aqueous solution containing ^{99m}technetium for use in the detection by scintography of bones and calcareous tumors, comprising:

(A) one or more water-soluble phosphonic compounds of the formulae:



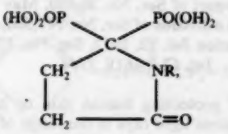
I

wherein R represents a substituent from the group consisting of H and C_{1-6} alkyl;



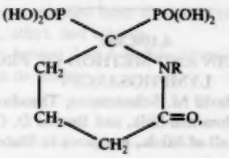
II

wherein R represents a substituent from the group consisting of H and C_{1-4} alkyl;



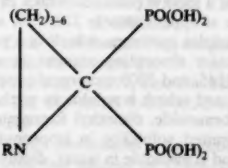
III

wherein R represents a substituent from the group consisting of H and C_{1-6} alkyl;



IV

wherein R represents a substituent from the group consisting of H and C_{1-6};



V

wherein R represents a substituent from the group consisting of H and C_{1-4} alkyl;

VI the pharmaceutically-acceptable water-soluble salts of the above acids (I)—(V); and

(B) a pharmaceutically acceptable water-soluble salt selected from the group consisting of tin (II), iron (II) and chromium (II) salts and mixtures thereof in less than stoichiometric quantity relative to component (A).

4,104,367
RADIOIMMUNOASSAY FOR METHADONE

Magdalena Usategui Gomez, Wayne; Harvey Gurien, Irvington; John Edward Heveran, Fairfield, and Manfred Weigele, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 13, 1976, Ser. No. 731,620
Int. Cl.[2] G01N *33/16;* A61K *43/00*
U.S. Cl. 424—1 **15 Claims**

4. A method for the radioimmunoassay of methadone in a sample which method comprises mixing said sample with a known amount of I^{125} radiolabelled methadone derivative selected from the group consisting of I^{125} -N-2-(4-hydroxyphenyl)-ethylsuccinamic acid N-methyl-N- [1-methyl-3,3-diphenyl-4-oxohexyl] aminoethanol ester and I^{125}-6-dimethylamino-4-phenyl-4-(4-hydroxyphenyl)-hepten-3-one and an antibody which will selectively complex with methadone and said radiolabeled methadone derivative, measuring the degree of binding of the said labeled methadone derivative and determining the amount of methadone present in said sample by comparing said degree of binding to a standard curve obtained by mixing known amounts of methadone with fixed amounts of said labeled methadone derivative and said antibody and determining the degree of binding for each known amount of methadone.

4,104,368
COMPOSITION AND METHOD FOR PROTECTING SKIN AND HAIR

Arnold Lada, Montclair, and James J. Middleton, Orange, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 36,490, May 11, 1970, abandoned, which is a division of Ser. No. 747,500, Jul. 25, 1968. This application Jul. 12, 1972, Ser. No. 271,206
Int. Cl.[2] A61K *7/44*
U.S. Cl. 424—60 **2 Claims**

1. A method of protecting human skin or hair from the effects of erythematous light rays in the range of wave length of between about 2200A and 3120A which comprises applying to said skin or hair an effective amount sufficient to obtain effective radiation absorption within such range of stearyl dimethyl benzyl ammonium p-aminobenzoate.

4,104,369
LYMPHOSARCIN AND METHOD OF PRODUCING LYMPHOSARCIN

Birger H. Olson; David M. Schuurmans; Theodore R. Watson, all of Lansing; Chun-nan Shih, and Burton D. Cardwell, both of East Lansing, all of Mich., assignors to State of Michigan, Lansing, Mich.

Filed Aug. 31, 1976, Ser. No. 719,132
Int. Cl.[2] A61K *35/74*
U.S. Cl. 424—115 **25 Claims**

1. Lymphosarcin, a methyl pentaene which in methanol has absorption maxima at approximately 322, 338, and 357 nanometers in the ultraviolet spectrum; which in a potassium bromide pellet has major absorption maxima at approximately 3450, 3050, 1460, 1145, and 1005 reciprocal centimeters in the infrared spectrum; and which is soluble in methanol, ethanol, butanol, phenol, formamide, dimethyl formamide, and proprionic acid; has limited solubility in isopropyl alcohol and tetrahydrofuran; and is insoluble in water, diethyl ether, petroleum ether, benzene, acetone, ethyl acetate, and acetonitrile.

2. A process for the preparation of lymphosarcin comprising cultivating *Streptomyces murinus* NRRL 8171 under aerobic conditions in an aqueous nutrient medium containing available sources of carbon, nitrogen and minerals to produce lymphosarcin in the medium, and recovering lymphosarcin therefrom.

22. A process for treating cancer in animals which comprises administering a therapeutically effective amount of lymphosarcin to an affected animal.

4,104,370
METHOD OF TREATING MAGNESIUM/POTASSIUM DEPLETION

Maurice Bloch, London, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Continuation-in-part of Ser. No. 487,117, Jul. 10, 1974, abandoned. This application Nov. 19, 1975, Ser. No. 633,210
Int. Cl.[2] A61K *33/14, 33/06, 9/22, 9/24*
U.S. Cl. 424—153 **8 Claims**

1. A method of treating magnesium/potassium depletion without the unwanted purgative action of magnesium in a human requiring such treatment which comprises administering orally to said human a pharmaceutical composition, in an effective amount of the composition to produce said activity, in solid form for oral administration in a sustained release capsule or layered tablet, comprising magnesium oxide, magnesium hydroxide or a non-toxic pharmaceutically acceptable salt of magnesium in combination with potassium chloride, the equivalent weight of the magnesium being between 1 and 3 times the equivalent weight of the potassium, together with a pharmaceutical carrier such that the rate of release of the magnesium and potassium into the digestive system is controlled so that the length of time of action of said composition is from 2 to 8 hours.

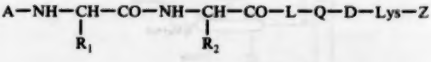
4,104,371
PSYCHOPHARMACOLOGICALLY ACTIVE PEPTIDES AND PEPTIDE-DERIVATIVES, AND THE USE THEREOF

Hendrik Marie Greven, Heesch, and David de Wied, Bilthoven, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jun. 30, 1977, Ser. No. 811,859
Claims priority, application Netherlands, Jul. 12, 1976, 7607684
Int. Cl.[2] A61K *37/100;* C07C *103/52*
U.S. Cl. 424—177 **23 Claims**

8. A pharmaceutical composition having conditioned flight inhibiting psychopharmacological properties, comprising:

(A) a pharmaceutically effective amount of a compound of the formula:



or a functional derivative thereof, wherein:

A is an N-terminal chain prolongation selected from the group consisting of H—(L or D)Met, H—(L or D) Met(→O), H—(L or D)Met(→O_2), desamino-Met, desamino-Met(→O), desamino-Met(→O_2), and H_2N—B—CO—, wherein B represents a branched or straight-chain alkylene (C_1-C_6) or alkylidene (C_1-C_6) group;

Q is an amino-acid residue —NH—CHR—CO—, wherein R is selected from the group consisting of alkyl (C_1-C_6), p-hydroxyphenylmethyl, 3-idolylmethyl, and phenylmethyl radials;

R_1 and R_2 each selected from hydrogen and alkyl (1-6C) groups; and

Z is seleted from the group consisting of N-(phenylalkyl-)amino, N-(β-indolylalkyl)amino, L-Trp, L-Phe-OH, L-Trp-Gly-OH, and L-Phe-Gly-OH; and

(B) a pharmaceutically acceptable carrier therefor.

4,104,372

1-N-(α-HYDROXY-ω-AMINOALKANOYL) DERIVATIVES OF 3'-DEOXYKANAMYCIN A AND THE PRODUCTION THEREOF

Hamao Umezawa; Sumio Umezawa, both of Tokyo, and Tsutomu Tsuchiya, Yokohama, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed Apr. 20, 1976, Ser. No. 678,560
Claims priority, application Japan, Apr. 24, 1975, 50-49105
Int. Cl.[2] A61K *31/71;* C07H *15/22*
U.S. Cl. 424—180 7 Claims

7. A pharmaceutical composition for treating infections in living animals, including man, caused by gram-negative and gram-positive bacteria, which comprises an anti-bacterially effective dosage of 1-N-((S)-γ-amino-α-hydroxybutyryl)-3'-deoxykanamycin A or a pharmaceutically acceptable acid-addition salt thereof as the active ingredient, in combination with a pharmaceutically acceptable carrier for the active ingredient.

4,104,373

THERAPEUTICAL COMPOSITION

Richard Sichert, Schneckenburger Strasse 42 8 Munich 80, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 43,947, Jun. 5, 1970, abandoned. This application May 16, 1973, Ser. No. 360,935
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1969, 1931467; Dec. 19, 1969, 1963706
Int. Cl.[2] A61K *35/78, 31/22, 47/00*
U.S. Cl. 424—195 11 Claims

1. A composition of matter for treating lymphatic congestions comprising a mixture of:

(a) an extract of an Umbelliferae selected from the group consisting of *Conium maculatum, Cicuta virosa, Aethusa cynapium* and *Oenanthe crocata,*

(b) an extract of a Liliaceae selected from the group consisting of *Colchicm autumnale, Veratrum album,* Aloe and Asparagi,

(c) an extract of a plant selected from the group consisting of Digitalis, Strophanthus, Convallaria and Crataegus,

(d) an extract of a Berberidaceae selected from the group consisting of Podophylli and *Berberis vulgaris,* and

(e) an extract of a Solanaceae selected from the group consisting of Hyoscyami, *Atropa belladonna,* Mandragorae and *Datura stramonium,*

the ratios of extracts (a), (b), (c), (d) and (e) present being, respectively, about 4 to 12 : about 2.8 to 9 : about 2 to 6.5 : about 2 to 6 : about 2 to 7.5.

4,104,374

WOOD PRESERVATIVE

Wolfgang Reuther, Ziegelhausen; Knut Oppenlaender; Paul Raff, both of Ludwigshafen; Ernst-Heinrich Pommer, Limburgerhof, and Manfred Siegler, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Jun. 21, 1976, Ser. No. 697,769
Claims priority, application Fed. Rep. of Germany, May 18, 1976, 2622028
Int. Cl.[2] A01N *9/00*
U.S. Cl. 424—185 5 Claims

1. A process for protecting wood against ligniperdous insects, termites, ligniperdous fungi, soft rot and mold fungi, which comprises bringing into contact with the wood an effective amount of wood preservative compounds effective against ligniperdous insects, termites, ligniperdous fungi, soft rot and mold fungi, said compounds being o-boric acid/propylene oxide adducts having a molar ratio of said acid to said propylene oxide in the range of 1:1 to 1:5, respectively, said adducts being formed by reacting said o-boric acid and propylene oxide either in an aprotic solvent at 100° to 160° C. in the absence of a catalyst or at 70° to 120° C. in a closed vessel in an aprotic solvent and in the presence of a catalytic amount of a base or a Lewis acid at a pressure of said propylene oxide of 4 to 9 bars, and thereafter distilling off said solvent.

4,104,375

ISOXAZOLE PHOSPHATES AND PHOSPHONATES

Llewellyn W. Fancher, Orinda, Calif., assignor to Stauffer Chemical Company, Weatport, Conn.

Filed Feb. 24, 1977, Ser. No. 771,503
The portion of the term of this patent subsequent to Jun. 13, 1995, has been disclaimed.
Int. Cl.[2] C07D *261/14;* A01N *9/36*
U.S. Cl. 424—200 48 Claims

1. A compound having the formula

in which

R is hydrogen or methyl,

R^1 is hydrogen or methyl,

R^2 is a member selected from the group consisting of methyl, methoxy, ethyl, and ethoxy,

R^3 is alkoxy having 1 to 6 carbon atoms, and

X is oxygen or sulfur.

17. A method of controlling insects comprising applying to said insects or the habitat or feedstuffs of said insects an insecticidally effective amount of a compound having the formula

in which

R is hydrogen or methyl,

R^1 is hydrogen or methyl,

R^2 is a member selected from the group consisting of methyl, methoxy, ethyl, and ethoxy,

R^3 is alkoxy having 1 to 6 carbon atoms, and

X is oxygen or sulfur.

4,104,376

SYNERGISTIC COMPOSITION FOR THE CONTROL OF INSECTS

Walter Maria Zeck, Vero Beach, Fla., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Jul. 7, 1977, Ser. No. 813,722
Int. Cl.[2] A01N *9/02, 9/20, 9/36*
U.S. Cl. 424—216 9 Claims

1. A synergistic insecticidal composition comprising an insecticidally effective amount of O-ethyl-O-[4-(methylthio)-phenyl]-S-propyl phosphorodithioate and N-methyl-N'-2,4-xylyl-N-(N-2,4-xylyl-formimidoyl) formamidine in a weight ratio of about 1:0.03–10.

4,104,377
DISUBSTITUTED-O-(1-FLUORO-2-HALOGENOETHYL)-PHOSPHORIC(PHOSPHONIC) ACID ESTERS, AND METHOD OF COMBATING INSECTS

Dieter Arlt, Cologne; Wolfgang Behrenz, Overath-Steinenbrueck; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

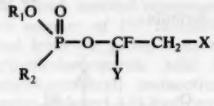
Filed Jun. 14, 1976, Ser. No. 696,147

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1975, 2528996

Int. Cl.[2] A01N *9/36;* **C07F** *9/09, 9/40*

U.S. Cl. 424—222 **12 Claims**

1. A 1-fluoro-2-halogeno-ethyl-phosphoric(phosphonic) acid ester of the formula



(I)

in which

R_1 is alkyl with 1 to 4 carbon atoms optionally substituted by fluorine, chlorine or bromine,

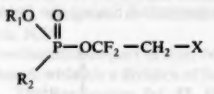
R_2 is alkyl with 1 to 4 carbon atoms and optionally substituted by fluorine, chlorine or bromine,

X is chlorine or bromine, and

Y is hydrogen or fluorine.

2. A method of combating insects, acarids or nematodes which comprises applying to the insects, acarids or nematodes or to a habitat thereof an insecticidally, acaricidally or nematicidally effective amount of a compound according to claim **1**.

9. A 1-fluoro-2-halogeno-ethyl-phosphoric(phosphonic) acid ester of the formula



in which

R_1 is alkyl with 1 to 4 carbon atoms optionally substituted by fluorine, chlorine or bromine,

R_2 is alkoxy with 1 to 4 carbon atoms and substituted by fluorine, chlorine or bromine, and

X is chlorine or bromine.

10. A method of combating insects, acarids or nematodes which comprises applying to the insects, acarids or nematodes or to a habitat thereof an insecticidally, acaricidally or nematicidally effective amount of a compound according to claim **9**.

4,104,378
COMBATTING PESTS WITH O,S-DIALKYL-O-(4-PHENYLAZOPHENYL)-THIOPHOSPHATES

Alexis A. Oswald, Mountainside, and Paul L. Valint, Woodbridge, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

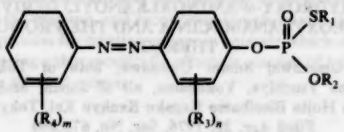
Division of Ser. No. 666,120, Mar. 11, 1976, Pat. No. 4,051,240, which is a continuation-in-part of Ser. No. 377,855, Jul. 9, 1973, abandoned. This application Jul. 18, 1977, Ser. No. 816,559

Claims priority, application Switzerland, Jul. 7, 1972, 10210/72; May 11, 1973, 6720/73

Int. Cl.[2] A01N *9/00, 9/36*

U.S. Cl. 424—225 **9 Claims**

1. A method for combatting insects, acarids and nematodes which comprises applying thereto an insecticidally, acaricidally or nematicidally effective amount of a compound of the formula



wherein R_1 represents propyl or butyl; R_2 represents methyl or ethyl; each of R_3 and R_4 represents hydrogen, halogen or alkyl having from 1 to 5 carbon atoms; *n* is a number from 1 to 4; and *m* is a number from 1 to 5.

4,104,379
SUBSTITUTED 1-ALKYLTHIOPHENYL-2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINE COMPOUNDS

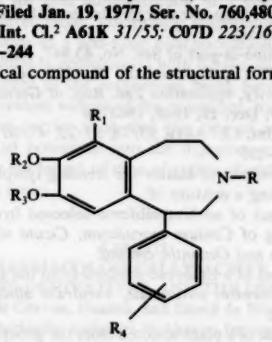
Gregory Gallagher, Jr., Collegeville, Pa.; Francis R. Pfeiffer, Cinnaminson, N.J., and Joseph Weinstock, Phoenixville, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Jan. 19, 1977, Ser. No. 760,480

Int. Cl.[2] A61K *31/55;* **C07D** *223/16*

U.S. Cl. 424—244 **16 Claims**

1. A chemical compound of the structural formula:



in which:

R is hydrogen, benzyl, phenethyl, carbobenzoxy, hydroxyethyl, lower alkyl of 1–5 carbons, lower alkenyl of 3–5 carbons or lower alkanoyl of 1–5 carbons;

R_1 is hydrogen, halo or trifluoromethyl;

R_2 and R_3 are each hydrogen, lower alkyl of 1–5 carbons, lower alkanoyl of 2–5 carbons or, when taken together, methylene and ethylene; and

R_4 is lower alkylthio of 1–5 carbons, lower alkylsulfinyl of 1–5 carbons, lower alkylsulfonyl of 1–5 carbons, trifluoromethylthio, trifluoromethylsulfonyl, trifluoromethylsulfinyl, or dimethylsulfonium halide; or a nontoxic, pharmaceutically acceptable salt thereof.

15. The method of inducing dopaminergic activity in a subject in need thereof comprising administering orally or by injection a nontoxic dopaminergic quantity of a compound of claim **1**.

4,104,380
DIBENZYL GLYCOLIC ACID DERIVATIVES

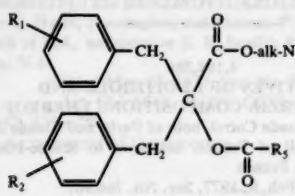
Wolf-Dieter Vigelius; Gerhard Satzinger, both of Denzlingen, and Manfred Herrmann, St. Peter, all of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 696,665, Jun. 16, 1976. This application Mar. 15, 1977, Ser. No. 777,731

Int. Cl.[2] A61K *31/55*

U.S. Cl. 424—244 **43 Claims**

1. A method of treating hypertonia and hyperacidity in a mammal by the administration to said animal of an effective amount of a compound having the formula:



wherein R_1 and R_2, which may be the same or different, are hydrogen, halogen, or lower alkyl or lower alkoxy of 1 to 3 carbon atoms; R_3 and R_4, which may be the same or different, are lower alkyl of 1 to 3 carbon atoms or R_3 and R_4, together with the nitrogen atom to which they are attached, is a saturated or unsaturated ring structure of 3 to 5 carbon atoms which, in the ring system, can contain an oxygen or imino group and can be substituted by a phenyl or benzyl radical or by lower alkyls of 1 to 4 carbon atoms; R_5 is hydrogen, lower alkyl or alkoxyalkyl of 1 to 5 carbon atoms or benzyl; alk is a branched or unbranched alkylidene of 2 to 4 carbon atoms; and the quaternary lower alkyl ammonium halides thereof and the pharmaclogically compatible salts thereof.

4,104,381

PHARMACOLOGICALLY ACTIVE COMPOUNDS

Graham John Durant, Welwyn Garden City; John Colin Emmett, Codicote, and Charon Robin Ganéllin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

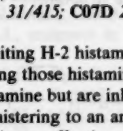
Division of Ser. No. 619,985, Oct. 6, 1975, Pat. No. 4,005,205, which is a division of Ser. No. 463,647, Apr. 24, 1974, Pat. No. 3,932,644. This application Oct. 29, 1976, Ser. No. 736,662

Claims priority, application United Kingdom, May 3, 1973, 21063/73; Jul. 26, 1973, 35551/73

Int. Cl.[2] A61K *31/54, 31/415;* **C07D** *285/16;* **C07B** *285/22*

U.S. Cl. 424—246 **5 Claims**

3. A method of inhibiting H-2 histamine receptors, said H-2 histamine receptors being those histamine receptors which are not inhibited by mepyramine but are inhibited by burimamide, which comprises administering to an animal in need of inhibition of said receptors in an effective amount to inhibit said receptors a heterocyclic compound of the formula:



wherein A taken together with the nitrogen and carbon atoms shown forms a benzothiadiazine or 1,2,4-thiadiazine ring, said rings having a sulfone group and optionally substituted by one or two lower alkyl, phenyl or benzyl groups; R is a grouping of the formula:

$$Het\text{-}CH_2Z(CH_2)_n\text{-}$$

where Het is an imidazole ring, said ring being optionally substituted by lower alkyl, amino, hydroxy or halogen; Z is sulphur or a methylene group and n is 2 or 3 or a pharmaceutically acceptable acid addition salt thereof.

4,104,382

PHARMACEUTICAL COMPOSITIONS AND METHODS OF INHIBITING H-1 AND H-2 HISTAMINE RECEPTORS

James Whyte Black, Hemel Hempstead, and Michael Edward Parsons, St. Albans, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

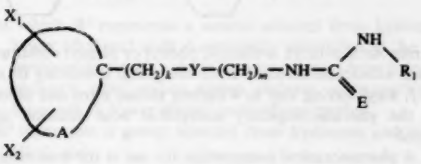
Division of Ser. No. 568,481, Apr. 16, 1975, Pat. No. 4,000,302, which is a continuation-in-part of Ser. No. 349,151, Apr. 9, 1973, Pat. No. 3,894,151. This application Sep. 27, 1976, Ser. No. 726,886

Claims priority, application United Kingdom, Apr. 20, 1972, 18301/72

Int. Cl.[2] A61K *31/40, 31/44, 31/135, 31/415*

U.S. Cl. 424—247 **6 Claims**

1. A pharmaceutical composition having H-1 and H-2 histamine receptor inhibiting activity which comprises about 30 mg. to about 250 mg. of an antihistamine, said antihistamine being a compound which inhibits those histamine receptors inhibited by mepyramine, about 50 mg. to about 500 mg. of an H-2 histamine receptor inhibitor, H-2 histamine receptors being those histamine receptors which are not inhibited by mepyramine but are inhibited by burimamide, and a pharmaceutically acceptable diluent or carrier, wherein said H-2 histamine receptor inhibitor is a compound of the formula:



wherein A is such that there is formed together with the carbon atom shown a thiazole, isothiazole or pyridine ring; X_1 is hydrogen, lower alkyl, halogen, amino or hydroxyl; X_2 is hydrogen; k is 1; m is 2; Y is sulphur; E is NR_2; R_1 is hydrogen or lower alkyl; and R_2 is hydrogen, nitro or cyano, or a pharmaceutically acceptable acid addition salt thereof.

4,104,383

DERIVATIVES OF PHENYLPROPENYLAMINE

François Krausz, Montpellier, France, assignor to C M Industries, Paris Cedex, France

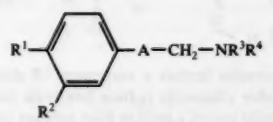
Continuation of Ser. No. 519,752, Oct. 31, 1974, abandoned. This application Jun. 4, 1976, Ser. No. 692,787

Claims priority, application United Kingdom, Nov. 2, 1973, 51123/73

Int. Cl.[2] A61K *31/395, 31/135*

U.S. Cl. 424—248.4 **12 Claims**

1. A method of treating adynamic and depressive states in a patient suffering from said states which comprises administering an anti-depressive amount of a compound of the formula:



(I)

in which R^2 is selected from the group consisting of a hydrogen atom and a halogen atom; R^1 is selected form the group consisting of a cyclohexyl group and phenyl group; and is a cyclohexyl group when R^2 is a halogen atom; A is selected from the group consisting of CH_2CH_2 and CH=CH groups; and NR^3R^4 is selected from the group consisting of an alkylamino group, a dialkylamino group and a heterocyclic group selected from the group consisting of pyrrolidino, morpholino, thiomorpholino, 2,6-dimethylmorpholino, piperidino, 4-methylpiperidino, piperazino, 4-(β-hydroxyethyl)-piperazino, 4-

methylpiperazino and azepino groups; and acid addition salts of said compounds.

4,104,384

1-(2'-AROYL ETH-1'YL) 2-(4''-ACETAMIDO PIPERAZINE-1''YL METHYL) BENZIMIDAZOLES AND THEIR THERAPEUTICAL APPLICATIONS

Claude P. Fauran; Michel J. Turin, both of Paris; Thierry F. Imbert, La Celle Saint-Cloud; Guy M. Raynaud, and Nicole A. M. Dorme, both of Paris, all of France, assignors to Delalande S.A., Courbevoie, France

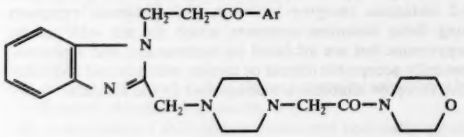
Division of Ser. No. 643,490, Dec. 22, 1975, Pat. No. 4,072,682. This application Nov. 28, 1977, Ser. No. 855,419

Claims priority, application France, Jan. 10, 1975, 75 00724; Dec. 5, 1975, 7537297

Int. Cl.[2] C07D *413/14;* A61K *31/535*

U.S. Cl. 424—248.51 **5 Claims**

1. A compound having the formula



wherein Ar is α-furyl, α-thienyl, phenyl or phenyl substituted by one substituent selected from the group consisting of methoxy, alkyl having one to 4 carbon atoms, nitro and chloro, and the pharmacologically acceptable acid addition salts thereof.

3. A pharmaceutical composition for use in the treatment of gastroduodenal ulcers, hypochlorohydrias, visceral spasms, asthma, hypertension, oedemas, and pains, comprising an effective amount of a compound as claimed in claim 1, in combination with a pharmaceutically acceptable carrier.

4,104,385

CYCLIC ALKYLIDENYL N-[6-(AMINO)-3-PYRIDAZINYL]AMINOMETHYLENEMALONATES

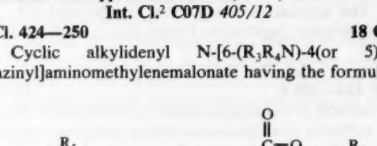
George Y. Lesher, and Chester J. Opalka, Jr., both of Schodack, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 715,699, Aug. 19, 1976, abandoned. This application Jun. 10, 1977, Ser. No. 805,419

Int. Cl.[2] C07D *405/12*

U.S. Cl. 424—250 **18 Claims**

1. Cyclic alkylidenyl N-[6-(R_3R_4N)-4(or 5)-R_5-3-pyridazinyl]aminomethylenemalonate having the formula



wherein

R_1 and R_2 are each lower-alkyl having from one to three carbon atoms;

R_3 and R_4 are each lower-alkyl having from one to three carbon atoms or R_3R_4N is 1-piperidinyl, 1-pyrrolidinyl, 4-methyl-1-piperazinyl, 4-morpholinyl or 4-morpholinyl having from one to four ring-carbon alkyl substituents selected from methyl, ethyl, n-propyl and isopropyl with the total number of carbon atoms of the alkyl substituent or substituents being from one to four;

R_5 is hydrogen or lower-alkyl having from one to three carbon atoms; or pharmaceutically acceptable salt thereof.

4,104,386

DERIVATIVES OF 1,2-DITHIOLE AND ANTI-BILHARZIA COMPOSITIONS THEREOF

Michel Barreau; Claude Cotrel, both of Paris, and Claude Jeanmart, Brunoy, all of France, assignors to Rhone-Poulenc Industries, Paris, France

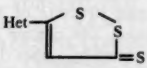
Filed Feb. 9, 1977, Ser. No. 766,967

Claims priority, application France, Feb. 10, 1976, 76 03603; Nov. 30, 1976, 76 36038

Int. Cl.[2] A61K *31/50, 31/505;* C07D *409/04*

U.S. Cl. 424—250 **8 Claims**

1. A 1,2-dithiole compound of the formula:



wherein Het represents a pyridazin-3-yl radical, or a pyridazin-3-yl radical substituted by a halogenatom or by an alkyl radical of 1 through 4 carbon atoms, on alkoxy radical of 1 through 4 carbon atoms, the mercapto radical, an alkylthio radical of 1 through 4 carbon atoms or a dialkylamino group having 1 through 4 carbon atoms in each alkyl radical.

8. A pharmaceutical composition with anti-bilharzia activity which comprises an effective amount of a 1,2-dithiole compound as claimed in claim 1 in association with one or more compatible and pharmaceutically acceptable diluents or adjuvants.

4,104,387

3-(ARYLCYCLOIMINOALKYL)BENZISOTHIAZOLE 1,1-DIOXIDES

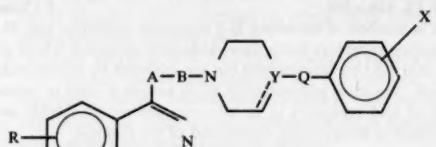
Peter C. Wade, Pennington, and Thomas P. Kissick, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 23, 1977, Ser. No. 799,865

Int. Cl.[2] A61K *31/495;* C07D *417/12*

U.S. Cl. 424—250 **12 Claims**

1. A compound of the structure



wherein R is hydrogen, halogen, lower alkyl, lower alkoxy or nitro; R^1 is hydrogen, lower alkoxy or halogen with the proviso that R^1 can be lower alkoxy or halogen only when R is lower alkoxy or halogen, respectively; A is O or NH; X is hydrogen, halogen, lower alkyl, lower alkoxy, or trifluoromethyl; Y is C or N, where Y is C, ---- represents a double bond, and when Y is N, ---- represents a single bond, B is an alkylene group containing 2 to 5 carbons in the normal chain; Q is a single bond or an alkylene group containing 1 to 3 carbons in the normal chain; and physiologically acceptable acid-addition salts thereof.

11. A composition which comprises a compound of claim 1 in a physiologically acceptable vehicle, said compound being present in an effective amount for treating an inflammatory condition.

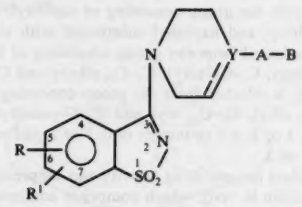
4,104,388

3-SUBSTITUTED BENZISOTHIAZOLE, 1,1-DIOXIDES

Peter C. Wade, Pennington, and Thomas P. Kissick, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 23, 1977, Ser. No. 799,879
Int. Cl.[2] A61K *31/495;* C07D *417/04*
U.S. Cl. 424—250 20 Claims

1. A compound of the structure



wherein R is hydrogen, halogen, lower alkyl, lower alkoxy, or nitro, R^1 is hydrogen, lower alkoxy or halogen with the proviso that R^1 can be lower alkoxy or halogen only when R is lower alkoxy or halogen, respectively; Y is C or N, where Y is C, ═══ represents a single bond or a double bond, and when Y is N, ═══ represents a single bond, A is a single bond or an alkylene group containing from 1 to 4 carbons, and B is hydrogen, hydroxyl, phenyl or phenyl substituted with halogen, lower alkyl, lower alkoxy, or trifluoromethyl, with the proviso that when Y is C, B is phenyl or substituted phenyl, and when Y is N and B is hydrogen, A has at least 1 carbon and when B is hydroxyl, A has at least 2 carbons; and physiologically acceptable acid-addition salts thereof where Y is N.

19. A composition for treating an inflammatory condition which comprises an effective amount of a compound of claim 1 in a physiologically acceptable vehicle.

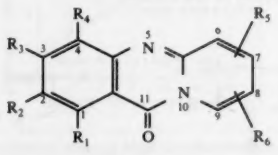
4,104,389

ANTIALLERGIC PYRIDO[2,1-b]QUINAZOLIN-ONES

Charles F. Schwender, Lebanon, and Brooks R. Sunday, Hackettstown, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 620,471, Oct. 7, 1975, Pat. No. 4,033,961.
This application Mar. 7, 1977, Ser. No. 775,015
Int. Cl.[2] A61K *31/505*
U.S. Cl. 424—251 7 Claims

1. A method of inhibiting the symptoms of an allergic reaction resulting from a antigen-antibody reaction in a sensitized mammal which comprises the administration to said mammal of an effective amount of compound or its pharmaceutically acceptable salt having the formula:



wherein R_1 and R_4 are hydrogen; R_2 is hydrogen, methyl, chlorine, hydroxy, or methoxy, or together with R_3 is dioxolo; R_3 is hydrogen, carboethyoxy, carboxyl, methyl, or chlorine or together with R_2 is dioxolo; R_5 is carboxyl, cyano, methyl or carbamoyl, with the proviso that R_5 is not 6-carboxyl when R_{1-4} are hydrogen; and R_6 is hydrogen.

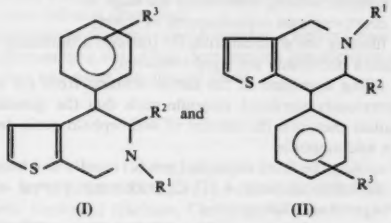
4,104,390

THIENO [2,3-c] AND [3,2-c] PYRIDINES

Gerard Ferrand, Lyon; Daniel Frehel, and Jean-Pierre Maffrand, both of Toulouse, all of France, assignors to Parcor, Paris, France

Filed Jun. 21, 1977, Ser. No. 808,694
Claims priority, application France, Jul. 13, 1976, 76 21440
Int. Cl.[2] C07D *513/04;* A61K *31/38*
U.S. Cl. 424—256 5 Claims

1. Pyridine derivatives having the following formulae (I) and (II):



(I) (II)

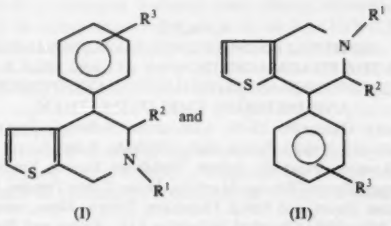
in which R^1 represents a radical selected from hydrogen, lower alkyl and aralkyl optionally substituted in the aromatic nucleus with at least a group selected from halogen, hydroxy, nitro, amino, cyano, carboxy, alkoxycarbonyl, lower alkyl, lower alkoxy and trifluoromethyl;

R^2 represents a group selected from hydrogen and lower alkyl; and

R^3 represents a group selected from hydrogen and at least a substituent selected from halogen, hydroxy, lower alkyl and lower alkoxy,

and their pharmaceutically acceptable inorganic and organic acid addition salts.

4. Therapeutic composition having an anti-inflammatory and blood-platelet aggregation inhibiting activity, comprising, as active ingredient, an efficient amount of a pyridine derivative selected from the compounds having the following formulae (I) and (II):



(I) (II)

in which R^1 represents a radical selected from hydrogen, lower alkyl and aralkyl optionally substituted in the aromatic nucleus with at least a group selected from halogen, hydroxy, nitro, amino, cyano, carboxy, alkoxycarbonyl, lower alkyl, lower alkoxy and trifluoromethyl;

R^2 represents a group selected from hydrogen and lower alkyl; and

R^3 represents a group selected from hydrogen and at least a substituent selected from halogen, hydroxy, lower alkyl and lower alkoxy,

and their pharmaceutically acceptable inorganic and organic acid addition salts, together with pharmaceutically acceptable excipients.

4,104,391

METHOD OF PREPARING STABLE STERILE AMPOULES OF CRYSTALLINE CEPHALOSPORINS FOR PARENTERAL ADMINISTRATION

Michael D. Cise, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 567,224, Apr. 11, 1975, Pat. No. 4,029,655. This application Feb. 9, 1977, Ser. No. 767,234

Int. Cl.[2] A61K *31/38;* **C07D** *501/12*

U.S. Cl. 424—246 **11 Claims**

1. A method of preparing an ampoule of a sterile, essentially crystalline cephalosporin for reconstitution for parenteral administration, said cephalosporin being selected from the group consisting of cephalothin sodium, cephaloridine betaine and cefazolin sodium, comprising the steps of:

(a) dissolving said cephalosporin in water;

(b) filtering the solution from (a) through a sterilizing filter into a previously sterilized container;

(c) filling a volume of the sterile solution from (b) into a previously sterilized ampoule such that the quantity of solute therein is the amount of said cephalosporin desired in said ampoule;

(d) cooling the filled ampoule from (c) rapidly to a temperature below at least −15° C. within an interval of not longer than 3 hours;

(e) warming the ampoule from (d) to between <0° C. and about −10° C.;

(f) maintaining the temperature of the ampoule from (e) between <0° C. and about −10° C. until the nucleation of the crystals of said cephalosporin is substantially complete;

(g) reducing the pressure of the environment in which the ampoule from (f) is maintained to a maximum of 1mm of mercury absolute.

(h) raising the temperature of the environment in which the ampoule from (g) is maintained to a maximum of about 50° C., avoiding the melting of the contents of such ampoule; and

(i) subliming the water from the preparation from (h) until the resulting crystals of said cephalosporin have a moisture content of no more than 6.0 percent.

4,104,392

N^2-NAPHTHALENESULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF, AND ANTITHROMBOTIC COMPOSITIONS AND METHODS EMPLOYING THEM

Shosuke Okamoto, 15-18, Asahigaoka 3-chome, Tarumi-ku, Kobe-shi, Hyogo, Japan; Akiko Hijikata, Kobe, Japan; Ryoji Kikumoto, Machida, Japan; Yoshikuni Tamao, Yokohama, Japan; Kazuo Ohkubo, Machida, Japan; Tohru Tezuka, Yokohama, Japan, and Shinji Tonomura, Tokyo, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo and Shosuke Okamoto, both of, Japan

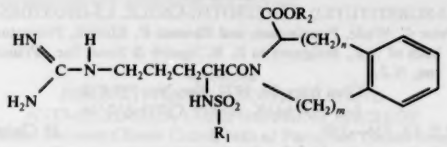
Continuation-in-part of Ser. No. 671,436, Mar. 29, 1976, Pat. No. 4,066,758, and Ser. No. 671,568, Mar. 29, 1976, Pat. No. 4,049,645, each is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Sep. 30, 1976, Ser. No. 728,051

Claims priority, application Japan, Nov. 8, 1974, 49/128774; Nov. 8, 1974, 49/128775; Nov. 29, 1974, 49/136695; Nov. 29, 1974, 49/136697; Feb. 25, 1975, 50/023268; Feb. 26, 1975, 50/023635; Mar. 5, 1975, 50/026768; Mar. 11, 1975, 50/029357; Mar. 11, 1975, 50/029358

Int. Cl.[2] A61K *31/47, 31/40;* **C07D** *217/26, 209/44*

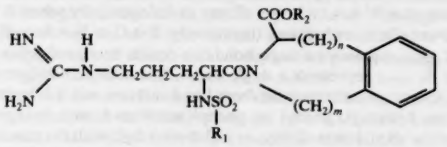
U.S. Cl. 424—258 **12 Claims**

1. N^2-naphthalenesulfonyl-L-argininamides having the formula



and the pharmaceutically acceptable salts thereof, wherein R_1 is selected from the group consisting of naphthyl, 5,6,7,8-tetrahydronaphthyl and naphthyl substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy and C_2–C_{20} dialkylamino; R_2 is selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl and C_7–C_{12} aralkyl; m is an integer of 0, 1 or 2; n is an integer of 0, 1 or 2; and $m + n$ is an integer of 1 or 2.

11. A method for inhibiting activity and suppressing activation of thrombin in vivo, which comprises administering to a patient a pharmaceutically effective amount of an N^2-naphthalenesulfonyl-L-argininamide having the formula



or the pharmaceutically acceptable salt thereof, wherein R_1 is selected from the group consisting of naphthyl, 5,6,7,8-tetrahydronaphthyl and naphthyl substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy and C_2–C_{20} dialkylamino; R_2 is selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl and C_7–C_{12} aralkyl, m is an integer of 0, 1 or 2; n is an integer of 0, 1 or 2; and $m + n$ is an integer of 1 or 2.

12. A pharmaceutical composition which comprises an antithrombotically effective amount of a compound of claim **1** and a pharmaceutically acceptable adjuvant.

4,104,393

1,3,5-TRISUBSTITUTED-1,2,4-TRIAZOLE COMPOUNDS

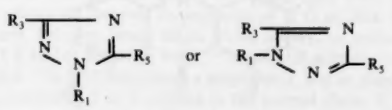
John J. Baldwin, Lansdale, and Frederick C. Novello, Berwyn, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 672,899, Apr. 2, 1976, Pat. No. 4,048,183, which is a division of Ser. No. 599,504, Jul. 28, 1975, Pat. No. 3,978,054, which is a division of Ser. No. 527,992, Nov. 29, 1974, Pat. No. 3,928,361, which is a division of Ser. No. 361,914, May 21, 1973, Pat. No. 3,882,134. This application Sep. 2, 1977, Ser. No. 830,245

Int. Cl.[2] A61K *31/44;* **C07D** *249/08*

U.S. Cl. 424—263 **8 Claims**

1. A compound of the formula



wherein

R_1 is a substituted loweralkyl having one of the substituents carboxy or cyano;

R_3 is pyridyl; and

R_5 is pyridyl.

4,104,394
METHOD FOR DIAMETRICALLY EXPANDING THERMALLY CONTRACTIVE PTFE RESIN TUBE

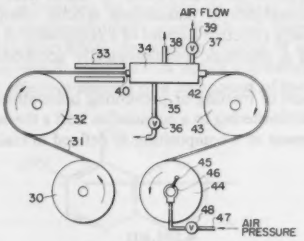
Koichi Okita, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 14, 1976, Ser. No. 750,319

Claims priority, application Japan, Dec. 15, 1975, 50-149718; Dec. 24, 1975, 50-155226; Sep. 22, 1976, 51-114006; Sep. 11, 1976, 51-134853

Int. Cl.[2] B29C *17/07*

U.S. Cl. 264—89 **20 Claims**



1. A method of manufacturing a thermall contractive tube of a desired diameter from a polytetrafluoroethylene resin, comprising the ordered steps of:

a. extruding a mixture of liquid lubricant and tetrafluoroethylene resin to form an unsintered tube;

b. removing said lubricant;

c. heating said unsintered tube to a temperature higher than 327° C under atmospheric pressure;

d. immediately after the heating step, and while the tube temperature is still above 327° C, reducing the pressure applied to the outer surface of the tube to provide a pressure differential between the inner and outer surfaces of the tube sufficient to thereby radially expand the tube to said desired diameter: and

e. cooling the tube to a temperature below 327° C while maintaining the pressure differential.

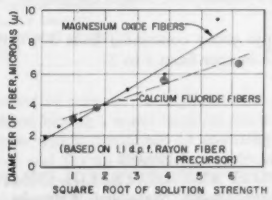
4,104,395
METHOD FOR CONTROLLING DIAMETERS OF MICROCRYSTALLINE MINERAL FIBERS

Irwin Frankel, Springfield, Va., assignor to Versar, Inc., Springfield, Va.

Filed Jun. 23, 1977, Ser. No. 809,255

Int. Cl.[2] D02G *3/00*

U.S. Cl. 264—60 **3 Claims**



1. The method of making high tensile strength microcrystalline mineral fibers, by impregnating organic rayon precursor fibers with a desired mineral compound selected from the group magnesium oxide and calcium fluoride which is deposited in the fibers in solution form, and then calcining the impregnated precursor, where the diameters of the resulting mineral fibers for a particular diameter of precursor fiber are controlled and varied linearly as the square root of the strength of the impregnating mineral compound solution, the process including the steps of:

(a) washing and drying rayon precursor fibers to drive moisture therefrom until their weight becomes substantially constant;

(b) immersing the dried fibers in an impregnating solution and depositing the desired mineral compound in the precursor fibers with such concentration that the mole ratio of mineral compound deposited to rayon precursor lies in the range from 0.0015 to just below 0.25;

(c) drying the fibers to drive the moisture therefrom;

(d) heating the fibers in a furnace gradually to a temperature of about 400° C and maintaining that temperature for about 4 hours to drive off the organic precursor fibers and leave mineral fibers, and

(e) further heating the mineral fibers to a higher temperature approaching but below their melting temperature to calcine and sinter the mineral fibers.

4,104,396
2-PIPERIDINOALKYL-1,4-BENZODIOXANS

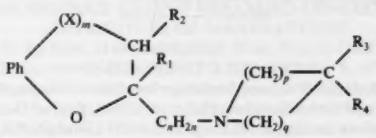
Charles Ferdinand Huebner, Chatham, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 589,118, Jun. 23, 1975. This application Apr. 26, 1976, Ser. No. 680,318

Int. Cl.[2] C07D *405/06*; A61K *31/445*

U.S. Cl. 424—267 **8 Claims**

1. A compound corresponding to the formula



wherein Ph is unsubstituted 1,2-phenylene or 1,2-phenylene substituted by one or two identical or different members selected from lower alkyl, hydroxy, mercapto, lower alkoxy, lower alkylenedioxy, benzyloxy, lower alkylthio, halogeno, trifluoromethyl, nitro, or amino; X is oxygen; *m* is the integer 1; *n* is an integer from 1 to 4; each of *p* and *q* is an integer from 1 to 3, but $(p + q) = 4$; each of R_1 and R_2 is hydrogen or lower alkyl; R_3 is hydrogen, hydroxy, lower alkoxy, alkanoyloxy of up to 18 carbon atoms and R_4 is lower alkyl or HPh-C_nH_{2n} or a therapeutically acceptable acid addition salt thereof.

7. A neuroleptic or analgetic pharmaceutical composition comprising a neuroleptically or analgetically effective amount of a compound claimed in claim **1**, together with a pharmaceutical excipient.

8. A method of treating aggression, agitation, anxiety or pain in mammals, which consists in administering to said mammal enterally or parenterally a composition claimed in claim **7**.

4,104,397
SPIRO (1,3-DIOXOLANE-4,3') QUINUCLIDINE COMPOUNDS

Sasson Cohen, Tel-Aviv, and Abraham Fisher, Holon, both of Israel, assignors to The Purdue Frederick Company, Norwalk, Conn.

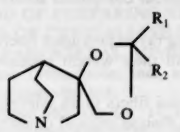
Filed Feb. 6, 1976, Ser. No. 656,056

Claims priority, application Israel, Nov. 11, 1975, 48452

Int. Cl.[2] A61K *31/445*; C07D *455/02*

U.S. Cl. 424—267 **8 Claims**

1. A compound selected from the group consisting of spiro (1,3-dioxolane-4,3') quinuclidines of the formula


(I)

wherein R_1 and R_2 are each selected from the group consisting of hydrogen, lower alkyl, and phenyl, and physiologically compatible salts thereof.

4,104,398

3-LOWER ALKOXYCYPROHEPTADINES AS SEROTONIN INHIBITORS

David C. Remy, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 12, 1976, Ser. No. 713,773
Int. Cl.[2] C07D *211/70;* A61K *31/445*
U.S. Cl. 424—267 **6 Claims**

1. A compound, (−)-1-methyl-4-(3-lower alkoxy-5H-dibenzo[a,d]cyclohepten-5-ylidene)piperidine, or pharmaceutically acceptable salt thereof.

3. A pharmaceutical antiserotonin composition in unit dosage form comprising a pharmaceutical carrier and an effective amount of (−)-1-methyl-4-(3-lower alkoxy-5H-dibenzo[a,d]-cyclohepten-5-ylidene)piperidine.

5. A method of inhibiting serotonin which comprises the administration to a patient in need of such treatment of an effective amount of (−)-1-methyl-4-(3-lower alkoxy-5H-dibenzo[a,d]cyclohepten-5-ylidene)piperidine.

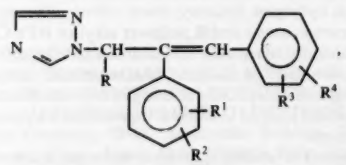
4,104,399

TRIAZOLE DERIVATIVES

Ernst-Heinrich Pommer, Limburgerhof; Klaus Gutsche, Rellingen, and York Hartleben, Heist, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 6, 1977, Ser. No. 839,761
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1976, 2652313
Int. Cl.[2] C07D *249/08*
U.S. Cl. 424—269 **5 Claims**

1. Triazole derivatives of the formula



where R denotes hydrogen, lower alkyl or phenyl, R^1 denotes hydrogen or halogen, R^2 denotes hydrogen or halogen, R^3 denotes hydrogen, halogen or methoxy, and R^4 denotes hydrogen, halogen, methoxy or methyl, and salts thereof.

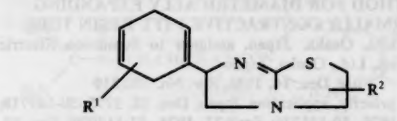
4,104,400

IMIDAZO(2,1-b)THIAZOLE DERIVATIVES, COMPOSITIONS CONTAINING SAME, AND METHOD OF TREATING HELMINTHIASIS

Frank Lee Weisenborn; Rudiger D. Haugwitz, both of Titusville, and Frederic Peter Hauck, Somerville, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 8, 1977, Ser. No. 813,910
Int. Cl.[2] C07D *513/04;* A61K *31/425*
U.S. Cl. 424—270 **12 Claims**

1. A compound of the structure



wherein R^1 is hydrogen, lower alkyl, or carboxy, and R^2 is hydrogen, lower alkyl or phenyl, and physiologically acceptable acid-addition salts thereof.

7. A pharmaceutical composition for use in treating or preventing helminthiasis in mammalian species comprising an anthelmintically effective amount of a compound as defined in claim 1 and a non-toxic physiologically acceptable carrier therefor.

9. A method of treating or preventing helminthiasis, which comprises administering to a mammalian host a therapeutically effective amount of a composition as defined in claim 7.

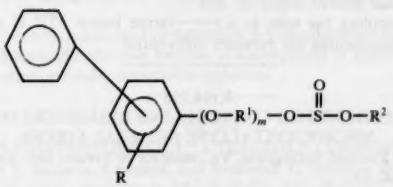
4,104,401

CONTROL OF INSECTS AND ACARIDS WITH ALKYNYL PHENYLPHENOL DIVALENT ALIPHATIC SULFITES

Rupert A. Covey, Bethany, and Robert E. Grahame, Jr., Cheshire, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 598,463, Jul. 23, 1975, Pat. No. 4,003,940, which is a division of Ser. No. 414,047, Nov. 8, 1973, Pat. No. 3,916,005. This application Oct. 29, 1976, Ser. No. 737,121
Int. Cl.[2] A01N *9/14*
U.S. Cl. 424—303 **11 Claims**

1. A method for killing insects and acarids, including mites and ticks, comprising applying to said insects or acarids or a locus subject to attack by said pests a pesticidally effective amount of a sulfite having the formula:



wherein R is hydrogen, bromine, chlorine, iodine or an alkyl radical having not more than 6 carbon atoms;

R^1 is an ethylene, 1,2-propylene, 1,2-butylene or 2,3-butylene radical or a cycloalkylene radical containing 5 or 6 carbon atoms;

R^2 is an alkynyl group containing from 3–6 carbon atoms; and, *m* is an integer from 1 to 3.

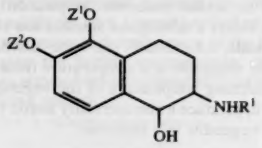
4,104,402

5,6-DIHYDROXY AMINOTETRALOL COMPOUNDS

Hirosada Sugihara, Osaka; Masazumi Watanabe, Kawanishi; Michio Motohashi, Kobe; Masao Nishikawa, Kyoto, and Yasushi Sanno, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

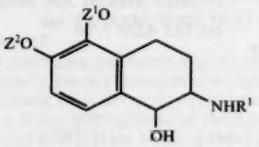
Division of Ser. No. 555,128, Mar. 4, 1975, Pat. No. 4,010,202. This application Nov. 11, 1976, Ser. No. 741,020
Claims priority, application Japan, Apr. 25, 1974, 49-47211
Int. Cl.[2] C07C *87/28;* A01N *9/20*
U.S. Cl. 424—330 **15 Claims**

1. A compound of the formula



wherein each of Z^1 and Z^2 is hydrogen and R^1 is alkyl of 1–6 carbon atoms substituted by phenyl, said phenyl being unsubstituted or substituted by hydroxyl or alkoxy of 1–4 carbon atoms, or a pharmaceutically acceptable salt thereof.

14. A pharmaceutical composition capable of use as a bronchodialator which comprises, as active ingredient, a pharmaceutically effective amount of a compound of the formula



(I)

wherein each of Z^1 and Z^2 is hydrogen and R^1 is alkyl of 1–6 carbon atoms, substituted by phenyl, said phenyl being unsubstituted or substituted by hydroxyl or alkoxy of 1–4 carbon atoms, or a pharmaceutically acceptable salt thereof, together with a pharmaceutically acceptable carrier therefor.

4,104,403

WATER-OIL EMULSIONS AND METHOD OF PREPARING SAME

Graham Barker, Fair Lawn, and Martin J. Barabash, Montvale, both of N.J., assignors to Witco Chemical Corporation, New York, N.Y.

Filed Dec. 21, 1976, Ser. No. 753,147
Int. Cl.² A61K *47/00, 31/00*
U.S. Cl. 424—365 **12 Claims**

1. A high internal phase ratio cosmetic emulsion having a water disperse phase and an oil continuous phase which comprises (a) a cosmetic emulsion oil, (b) an emulsifier combination comprising aluminum and/or calcium stearate and an alkali metal phosphoric acid ester of a mono- and/or diglyceride, and (c) water, said components (a) (b) and (c) being present in the following concentration ranges expressed in percent by weight based upon the total weight of the resulting emulsion:

Component	Concentration Range
(a) Cosmetic emulsion oil	balance
(b) Al/Ca stearate	0.5 – 3.0
Phosphated glyceride	0.5 – 5.0
(c) H_2O	40.0 – 85.0

7. A method of preparing a high internal phase ratio cosmetic emulsion having a water disperse phase and an oil continuous phase which comprises (i) admixing (a) a cosmetic emulsion oil and (b) an emulsifier combination comprising aluminum and/or calcium stearate and an alkali metal phosphoric acid ester of a mono- and/or di-glyceride and (ii), while agitating, blending therewith (c) water which has been heated to a temperature in the range of about 90° to about 95° C, said components (a) (b) and (c) being present in the following concentration ranges expressed in percent by weight based upon the total weight of the resulting emulsion:

Component	Concentration Range
(a) Cosmetic emulsion oil	balance
(b) Al/Ca stearate	0.5 – 3.0
Phosphated glyceride	0.5 – 5.0
(c) H_2O	40.0 – 85.0

4,104,404

CROSS-LINKED AMIDE/OLEFIN POLYMERIC TUBULAR FILM COEXTRUDED LAMINATES

Anne C. Bieler, Greenville, and Henry G. Schirmer, Spartanburg, both of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Division of Ser. No. 556,755, Mar. 10, 1975, Pat. No. 3,997,383. This application May 24, 1976, Ser. No. 689,440
Int. Cl.² B65D *85/30*
U.S. Cl. 428—35 **5 Claims**

1. A coextruded, tubular, laminated polymeric film for use in elevated temperature media comprising:

(a) a layer comprising a film-forming amide polymer;

(b) a layer comprising a mono-alpha olefin polymer;

(c) an adhesive disposed between said amide and olefin layers, said adhesive having mono-olefin units as the major component thereof;

(d) said adhesive and said olefin polymer each being cross-linked by radiation to a dosage level of at least 6 MR.

4,104,405

FOOD PRODUCT HAVING EXPANDED CONFECTION AND METHOD OF MANUFACTURE

John H. Forkner, 2116 Mayfair Dr., West, Fresno, Calif. 93703

Continuation-in-part of Ser. No. 798,255, May 8, 1977, abandoned, which is a continuation of Ser. No. 550,549, Feb. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 517,078, Oct. 23, 1974, abandoned. This application Dec. 5, 1977, Ser. No. 857,091
Int. Cl.² A23G *3/00*; A21D *13/00*
U.S. Cl. 426—94 **21 Claims**

1. A food product comprising a shell of cooked dough having an upper annular head portion adapted to receive a mass of frozen dessert and a lower hand hold portion, and an annular cellular mass of solid friable expanded confection carried by and surrounding only the head portion and bonded to the outer peripheral surface of the same, said expanded mass surrounding the region that is adapted to receive a mass of frozen dessert.

4,104,406

COATED EXPANDED ANIMAL FOOD

William G. Stringer; Robert E. Schara, both of Battle Creek, and Charles T. Stocker, Augusta, all of Mich., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 337,338, Mar. 2, 1973, abandoned. This application Dec. 13, 1974, Ser. No. 532,341
Int. Cl.² A23J *3/00*
U.S. Cl. 426—99 **2 Claims**

1. A dry, porous particulate nutritionally balanced animal food product comprised of an expanded mixture of between 35 to 70% by weight farinaceous and from about 20 to about 50% by weight proteinaceous ingredients, said animal food product having coated on the exterior thereof an emulsified mixture comprised of an emulsifier, fat and a dextrin material selected from the group consisting of corn syrup, corn syrup solids, dextrins and mixtures thereof, said product containing on the exterior thereof from about 1 to 8% by weight fat and 1 to 8% by weight dextrin material, said animal food product characterized by its improved resistance to rapid extensive hydration when mixed with liquid and improved palatability.

4,104,407

EXPANDED ANIMAL FOOD COATED WITH DEXTRIN AND FAT

William G. Stringer; Robert E. Schara, both of Battle Creek, and Charles T. Stocker, Augusta, all of Mich., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 337,337, Mar. 2, 1973, abandoned. This application Nov. 27, 1974, Ser. No. 527,731

Int. Cl.[2] A23J *3/00*

U.S. Cl. 426—99 2 Claims

1. A dry, particulate, porous, nutritionally balanced animal food product comprising an expanded mixture of between 35 to 70% by weight farinaceous and from about 20 to 50% by weight proteinaceous ingredients, said animal food product having thereon a first coating of from about 1 to 8% by weight of a dextrin material selected from the group consisting of corn syrup, corn syrup solids, dextrins, and mixtures thereof and a second exterior coating of from 1 to 8% by weight of fat, said animal food product characterized by its improved resistance to rapid extensive hydration when mixed with liquid and improved palatability.

4,104,408

SUBSTANTIALLY NEUTRALIZED AQUEOUS LIQUID SMOKE COMPOSITIONS

Herman Shin-Gee Chiu, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,425

Int. Cl.[2] A22C *13/00*; A23L *1/22*

U.S. Cl. 426—135 30 Claims

1. An aqueous liquid smoke composition having a pH greater than 5, comprising a uniform mixture of smoke coloring and flavoring constituents, an alkaline neutralizing agent in an amount sufficient to maintain said composition at a pH greater than 5, and an amount of a water soluble alcohol solubilizing agent sufficient to prevent said smoke constituents from separating out.

4,104,409

PRODUCTION OF HOP EXTRACTS

Otto Vitzthum, Bremen; Peter Hubert, Bremen-Lesum, and Wolfgang Sirtl, Bremen, all of Germany, assignors to Studiengesellschaft Kohle mbH, Mülheim (Ruhr), Germany

Continuation of Ser. No. 498,159, Aug. 16, 1974, abandoned, which is a continuation of Ser. No. 258,587, Jun. 1, 1972, abandoned. This application Jan. 6, 1976, Ser. No. 646,780

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1971, 2127618

Int. Cl.[2] A23L *1/00*

U.S. Cl. 426—386 40 Claims

1. A process for the production of hop extract which comprises extracting air dried hops with an extraction solvent gas while maintaining the gas in the supercritical state with respect to temperature and pressure, and separating the hop extract from the solvent gas laden therewith.

4,104,410

PROCESSING OF GREEN VEGETABLES FOR COLOR RETENTION IN CANNING

George J. Malecki, 157 Weston Rd., Wellesley, Mass. 02181

Continuation-in-part of Ser. No. 427,242, Dec. 21, 1973, abandoned. This application Sep. 9, 1976, Ser. No. 721,878

Int. Cl.[2] A23B *7/00*

U.S. Cl. 426—399 7 Claims

1. A process for canning green vegetables to produce a canned product substantially having the green color characteristic of the fresh green vegetable, said process being characterized by the absence of a blanching step and the absence of an addition of color retention additives, said process consisting of the steps of:

maintaining the vegetable from the time of harvest at a temperature below its thermal injury temperature and in a storage condition which allows air to flow about said vegetable to inhibit anaerobic respiration whereby the vegetable enters a subsequent sterilization step in a fresh, respiring state, substantially the same as when harvested;

sterilizing the vegetable at a temperature from about 250° F up the scorching temperature of the vegetable for a time sufficient to produce a commercially sterile vegetable; and

sealing said vegetable in a container.

4,104,411

FORMING OF ICE LOLLIES AND OTHER CONFECTIONS

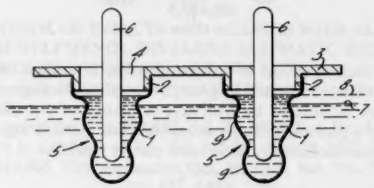
John Dennis Pooler, Stroud, England, assignor to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 560,933, Mar. 21, 1975, abandoned. This application Feb. 2, 1977, Ser. No. 764,818

Claims priority, application United Kingdom, Mar. 28, 1974, 13801/74

Int. Cl.[2] A23P *1/00*

U.S. Cl. 426—421 5 Claims



1. A method of forming moulded ice confections of re-entrant shape comprising filling ice confection mix into a plurality of thin-wall flexible elastic moulds of cavity shape which is re-entrant along at least one wall surface from the deepest part of the mould to the mouth of the mould, inserting a handle into the ice confection mix in each mould, applying a liquid freezant to the outer surface of each mould so as to freeze the ice confection mix and anchor the handle while said thin-wall moulds are supported by said freezant, and withdrawing the handle so as to cause the moulds to distort and release an ice confection of re-entrant shape on the handle.

4,104,412

METHODS AND SYSTEMS FOR MAKING AERATED CANDY

Harry A. Fischer, Frankenmuth, and Richard R. Wrubel, Ann Arbor, both of Mich., assignors to Baker Perkins Inc., Saginaw, Mich.

Filed Aug. 22, 1977, Ser. No. 826,400

Int. Cl.[2] A23G *3/00, 3/02*

U.S. Cl. 426—572 8 Claims

1. In a candy making process including the steps of:

(a) heating a candy mass to prepare a viscous melt product and discharging the heated mass in a stream;

(b) introducing the mass to a closed chamber and homogeneously intermixing a gas such as air with said melt product stream to form gas bubbles therein while moving the mass through said chamber under pressure, the improvements wherein:

(c) sequentially, as the product moves through the chamber, and in a repeated series of steps as the viscosity is maintained at a high level, the bubbles are repeatedly elongated and then sliced when the product is forced through reduced size openings and a low velocity knife moves through the product thereafter at a speed such as to slice the elongated bubbles, as distinguished from smashing them;

(d) cooling the product to remove "work energy" heat

therefrom during said slicing steps as the mass moves through the chamber and maintain the viscosity of the mass at a relatively high viscosity suited to slicing which prevents migration and coalescence of the bubbles; and

(e) discharging the bubble incorporating mass from the chamber to atmosphere at substantially the relatively high bubble slicing viscosity.

4,104,413

PREPARATION OF IMITATION CHEESE

John Dee Wynn; George Terrance Denton, both of Plano; Richard Judd Bell, Sherman; Harry Rowe Vernon, Dallas, all of Tex., and Lloyd Roy Custer, Columbus, Ohio, assignors to Anderson, Clayton & Co., Houston, Tex.

Continuation-in-part of Ser. No. 217,997, Jan. 14, 1972, abandoned. This application Jun. 10, 1974, Ser. No. 478,032

Claims priority, application Ireland, Feb. 17, 1971, 190/71; United Kingdom, Sep. 16, 1971, 43145/71

Int. Cl.[2] A23C *19/02, 19/12*

U.S. Cl. 426—582 **13 Claims**

1. A food resembling mozzarella cheese, said food comprising a substantially gas-free homogeneous blend of:

(a) an emulsion of water with hydrogenated soybean oil having a Wiley melting point of about 95° F., the water being about 47% and the fat being about 22% of the food,

(b) about 25% calcium caseinate, and

(c) about 1.3% adipic acid, said food having a pH of about 5.1.

6. A process for making a food having a moisture content between about 46 and 52% and resembling cheddar cheese, said food including about 12 to 35% fat having a Wiley melting point of between about 90° and 110° F. and dry ingredients including calcium caseinate in an amount equal to about 15 to 33% of the food, about 1 to 5% ungelatinized flour, up to about 2% of emulsifying salts in an amount effective to give desired characteristics of melting, shredding and matting, and about 0.5 to 1.8% of an acid selected from the class consisting of adipic, lactic, citric, malic, and combinations thereof, the food having a pH of about 4.8 and 5.7, said process comprising,

(a) melting the fat and then forming an emulsion of it with water under subatmospheric pressure, and

(b) blending the dry ingredients with the emulsion under high shear mixing, a subatmospheric pressure, and at a temperature above the melting point of the fat to form a substantially gas-free homogeneous blend of the dry ingredients and the emulsion.

4,104,414

PROCESS OF MAKING DEHYDRATED FRUIT JUICE

Abdul R. Rahman, and Wayne A. Deneke, both of Natick, Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 269,630, Jul. 7, 1972. This application Jun. 21, 1974, Ser. No. 481,926

Int. Cl.[2] A23L *2/06*

U.S. Cl. 426—599 **2 Claims**

1. A process for producing a dehydrated orange juice powder which is storage-stable, non-caking when packaged under vacuum in flexible packages and stored at temperatures of 100° F. or higher, and instantly rehydratable after storage at said temperatures, which comprises the steps of extracting orange juice from oranges, said orange juice comprising liquid and pulp components, centrifuging said orange juice at about 2000 r.p.m. for a time sufficient for separation of said orange juice into a sediment portion and a supernatant liquid portion to occur, said sediment portion containing substantially all of said pulp components, removing a first fraction of said supernatant liquid portion while leaving the remaining fraction of said supernatant liquid portion with said sediment portion, remixing said sediment portion with said remaining fraction of said supernatant liquid portion, freeze-vacuum-dehydrating the resulting mixture of said sediment portion with said remaining fraction of said supernatant liquid portion to produce dehydrated orange juice solids having a moisture content of not more than about 2.0 percent by weight, and comminuting said dehydrated orange juice solids to form a dehydrated orange juice powder of particle size capable of passing through a sieve having about 0.0335 inch openings, said first fraction being not less than about eighty percent by weight of said supernatant liquid portion and said remaining fraction being up to twenty percent by weight of said supernatant liquid portion.

4,104,415

PROCESS FOR PREPARING BACON ANALOG

Sudhakar P. Shanbhag, Yorktown Heights; Louis G. Liggett, Brooklyn, and Adrienne C. Mikovits, Suffern, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Oct. 10, 1975, Ser. No. 622,272

Int. Cl.[2] A23J *3/00*

U.S. Cl. 426—656 **5 Claims**

1. A process for preparing a bacon analog comprising: preparing a first slurry comprising from about 35 to about 55% water, from about 10 to about 20% fat, and from about 10 to about 50% of heat coagulable protein; preparing a second slurry comprising from about 20 to about 45% water, from about 25 to about 45% fat, and from about 15 to about 30% of heat coagulable protein; deaerating said first slurry sufficiently to raise the density thereof to about 1.08 g/cc; preparing a layered mass containing at least one layer of said first slurry and at least one layer of said second slurry, said first slurry amounting to at least 50% of the weight of the layered mass and said second slurry amounting to no more than 30% of the layered mass; heating said layered mass sufficiently to heat set the coagulable protein; slicing the resulting heat set layered mass; and immersing the slices into a bath of heated cooking oil at a temperature and for a time sufficient to reduce the moisture content of the slices to less than 10%.

4,104,416

THIN WALLED PROTECTIVE COATINGS BY ELECTROSTATIC POWDER DEPOSITION

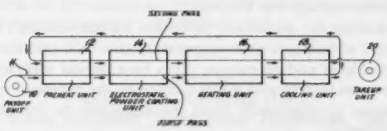
Mellapalayam R. Parthasarathy, Verdun; Douglas C. Nethersole, Laval, and Michael A. Dudley, Toronto, all of Canada, assignors to Canada Wire and Cable Limited, Toronto, Canada

Filed May 6, 1976, Ser. No. 683,749

Claims priority, application Canada, Feb. 5, 1976, 245068

Int. Cl.[2] B05D *1/06*

U.S. Cl. 427—29 **20 Claims**



1. A process for production of thin walled coatings on continuous elongated substrates through an electrostatic cloud application of two superimposed layers of powder material comprising the steps of:

(a) applying electrostatically a first layer of fusible powder material to a continuous elongated substrate by passing said substrate through an electrostatic cloud coater;

(b) at least partially fusing said first layer of powder material to provide a uniform coating on the elongated substrate;

(c) holding the at least partially fused coating at an elevated temperature below the full fusion temperature of the powder material to be applied as the second layer immediately prior to the application of said second layer, said elevated temperature being sufficient to reduce the surface resistivity of the first deposited layer, thereby resulting in a uniform second layer deposition;

(d) applying electrostatically a second layer of fusible pow-

der material to the at least partially fused first layer by passing the coated substrate through an electrostatic cloud coater; and

(e) fusing the total applied coating to achieve the desired coating thickness.

4,104,417

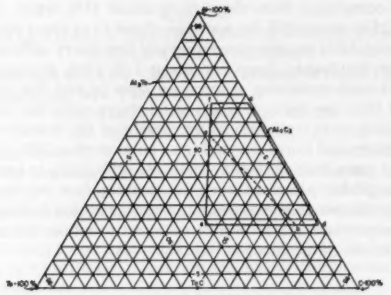
METHOD OF CHEMICALLY BONDING ALUMINUM TO CARBON SUBSTRATES VIA MONOCARBIDES

Raymond Vincent Sara, North Olmstead, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 444,556, Feb. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 340,287, Mar. 12, 1973, abandoned. This application Jun. 18, 1976, Ser. No. 697,611

Int. Cl.[2] B05D *3/06*

U.S. Cl. 427—37 **29 Claims**



1. A process for chemically bonding aluminum to a carbon substrate comprising:

(a) depositing aluminum and a metal selected from the group consisting of tantalum, titanium and hafnium onto a carbon substrate, wherein said metal is present in an amount greater than its solubility limit in said aluminum at the reaction temperature of the subsequent heating step (b), the insoluble amount of said metal being present at the carbon substrate as an insoluble intermetallic phase of said aluminum and said metal at the temperature of the subsequent heating step (b); and

(b) heating the aluminum, metal and carbon substrate in an inert atmosphere at a temperature at which said metal is soluble in said aluminum, for a time period sufficient to form an interface of metal carbide on the substrate which serves to chemically bond the aluminum to the carbon substrate.

20. A process for chemically bonding aluminum to a carbon substrate comprising:

(a) depositing a mixture comprising aluminum and a metal selected from the group consisting of tantalum, titanium and hafnium onto a carbon substrate, wherein said metal is present in said mixture in an amount greater than its solubility limit in said aluminum at the reaction temperature of the subsequent heating step (b), the insoluble amount of said metal being present at the carbon substrate as an insoluble intermetallic phase of said aluminum and said metal at the temperature of the subsequent heating step (b); and

(b) electric arc heating the deposited mixture to a temperature at which the metal is soluble in the aluminum for a time period sufficient to form an interface of metal carbide on the substrate which serves to chemically bond the aluminum to the carbon substrate.

4,104,418

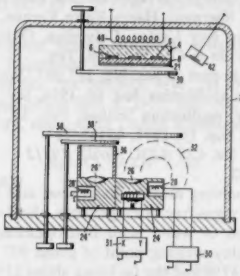
GLASS LAYER FABRICATION

Kyu C. Park, Yorktown Heights, N.Y., and Elizabeth J. Weitzman, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 615,967, Sep. 23, 1975, abandoned, which is a continuation of Ser. No. 462,289, Apr. 19, 1974, abandoned. This application Jul. 7, 1976, Ser. No. 703,382

Int. Cl.[2] B05D *3/06*

U.S. Cl. 427—42 **9 Claims**



1. Method of fabricating a dielectric glass layer on a substrate comprising the steps of:

heating a source of borosilicate glass in an evacuated chamber by a scanning electron beam to a uniformly heated molten pool whose surface area is in the range from at least $2cm^2$ to approximately $10cm^2$ to provide a stream of evaporated source material at a rate equivalent to 40–80 A/sec. as measured at approximately 10 inches away from said source,

shielding said substrate from said stream until the latter has attained a uniform evaporation rate,

maintaining said substrate at a temperature of 200° C to 300° C during such deposition,

depositing a layer of borosilicate glass of thickness less than approximately 50 microns on said substrate; and

annealing said deposited layer at temperature substantially higher than said substrate temperature during said depositing of said borosilicate glass.

4,104,419

SURFACE TREATMENT OF A TIN-PLATE

Keiichi Tanikawa, Yokohama; Tatsuro Obi, Tokyo; Tadashi Tanaka; Susumu Otsuka, both of Yokohama, and Takao Saito, Himeji, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 27, 1976, Ser. No. 718,318

Claims priority, application Japan, Aug. 27, 1975, 50-103677

Int. Cl.[2] B05D *3/02, 3/14*

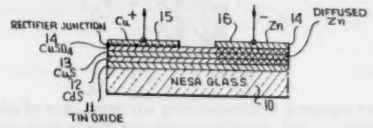
U.S. Cl. 427—46 **8 Claims**

1. A method for surface treating an electrolytic tin plate, comprising coating an electrolytically tin-plated steel sheet with an aqueous solution consisting essentially of 0.1 to 10% of a pyrazole derivative after the step of electrolytically tin-plating the steel sheet prior to the step of reflowing the plated tin layer on the steel sheet, and then subjecting the thus-treated tin plate to drying and reflowing.

4,104,420
PHOTOVOLTAIC CELL

John F. Jordan, El Paso, Tex., and Curtis Lampkin, Cincinnati, Ohio, assignors to Photon Power, Inc., El Paso, Tex.

Continuation of Ser. No. 607,233, Aug. 25, 1975, abandoned, which is a division of Ser. No. 476,062, Jun. 3, 1974, abandoned, which is a division of Ser. No. 303,365, Nov. 3, 1972, Pat. No. 3,902,920. This application Feb. 11, 1977, Ser. No. 767,684
Int. Cl.[2] B05D *5/12;* H01M *2/00*
U.S. Cl. 427—74 14 Claims



1. The method of fabricating a photovoltaic cell of the type having a layer comprised of CdS microcrystals on an electrically conductive surface of a substrate, wherein the improvement comprises the step of forming said layer by a spray process conducted while said electrically conductive surface is maintained at a constant temperature by heating said substrate while spraying said substrate through an oscillating nozzle which repeatedly re-traces a planar path designed to cover said substrate with spray, and at a sufficiently small rate of spray to enable said heating to supply heat to said substrate at a rate sufficient to maintain the temperature of said surface adjacent said planar path essentially constant during the spray process.

12. The method of fabricating a photovoltaic cell, comprising the steps of

forming a layer of CdS microcrystals over an electrically conductive layer on a substrate by a spray process;

forming a layer of Cu_2S over said layer of CdS to form a photovoltaic heterojunction with said CdS;

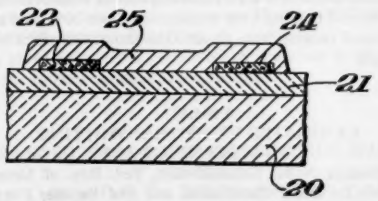
applying Zn over a portion of said layer of Cu_2S;

heating said Zn to about 500° F for a time sufficient to diffuse a portion of said Zn through said layer of Cu_2S and form a low resistance path between said electrically conductive layer and said Zn remaining above said Cu_2S.

4,104,421
METHOD OF MAKING A GLASS CONTAINING RESISTOR HAVING A SUB-MICRON METAL FILM TERMINATION

John P. Maher, Adams, and Theodore W. Johnson, Williamstown, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Division of Ser. No. 528,052, Nov. 29, 1974, Pat. No. 4,016,525. This application Aug. 3, 1976, Ser. No. 711,174
Int. Cl.[2] H01C *1/012*
U.S. Cl. 427—96 6 Claims

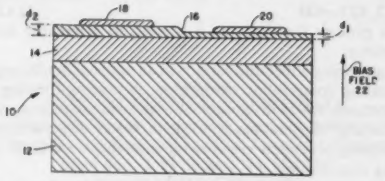


1. A method for making a resistor comprising preparing a termination paste consisting essentially of a metallo-organic compound , glass, and a quantity of particles determined from the total weight of said particles plus the metal of said compound, which quantity is selected from at least 20% silica, at least 17% manganese dioxide, and at least 17% of a mixture of silica and manganese dioxide, said glass amounting to as much as 22% by weight relative to the total weight of said glass plus said particles plus the metal of said compound, said silica particles having an average diameter no less than 0.2 micron; applying a coating of said paste to a substrate in selected areas thereof; firing said coated substrate; depositing a glass containing resistor ink on said substrate in overlapping relationship with said fired terminations; and firing said resistor ink, for the purpose of forming a cermet type resistor having sub-micron thick terminations.

4,104,422
METHOD OF FABRICATING MAGNETIC BUBBLE CIRCUITS

Robert Melvin Sandfort, St. Charles, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 455,219, Mar. 27, 1974, Pat. No. 3,921,157. This application Jun. 2, 1975, Ser. No. 582,787
Int. Cl.[2] B05D *5/12*
U.S. Cl. 427—123 3 Claims



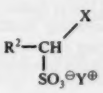
1. A method of fabricating a bubble chip, comprising the steps of depositing a first spacing layer of nonferromagnetic material on top of a sheet of magnetic bubble material, then depositing a second spacing layer of a different nonferromagnetic material on top of said first spacing layer, then selectively removing portions of said second spacing layer to leave a mesa topography in which the locations of raised plateaus correspond to the locations of subsequently applied ferromagnetic overlay circuit elements from which bubbles are to be deflectible, then depositing a layer of ferromagnetic material on top of the partially removed second spacing layer, and then selectively removing portions of said layer of ferrogmagnetic material to leave a pattern of ferromagnetic overlay circuit elements, selected ones of the circuit elements of said pattern being left at least partially on the raised plateaus of said second layer, whereby two different degrees of magnetic coupling are achieved for ferromagnetic overlay circuit elements with different functions on the same bubble chip.

4,104,423
CORROSION INHIBITORS

Peter Miles, Stockport; James Roger Hargreaves, Sale, and John Burrows, Congleton, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 14, 1977, Ser. No. 768,244
Claims priority, application United Kingdom, Feb. 21, 1976, 6935/76
Int. Cl.[2] C07C *143/14, 143/10;* B32B *15/18;* B05D *1/18*
U.S. Cl. 427—402 10 Claims

1. A compound having the general formula



wherein X is OH or NHR^1, Y is hydrogen or NH_3R^1, with the proviso that when X is OH Y cannot be hydrogen, R^1 is a saturated or unsaturated aliphatic or cycloaliphatic hydrocarbon radical containing from 1 to 20 carbon atoms optionally

substituted by one or more halogen, cyano, nitro, hydroxyl, carboxyalkyl or sulphoxyalkyl radicals in which the alkyl group contains from 1 to 4 carbon atoms, and R^2 is an aryl, alkaryl or aralkyl radical containing from 6 to 20 carbon atoms which may be optionally substituted by one or more cyano, nitro, halogen, hydroxyl, carboxyl, carboxymethyl, carboxyethyl, hydroxymethyl or methoxymethyl radicals or mixtures thereof.

4,104,424

PROCESS FOR COATING METALS

Lester Steinbrecher, Southampton, and Wilbur S. Hall, Plymouth Meeting, both of Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Continuation-in-part of Ser. No. 113,685, Feb. 8, 1971, abandoned, which is a division of Ser. No. 791,801, Jan. 16, 1969, Pat. No. 3,585,084, which is a continuation-in-part of Ser. No. 554,336, Jun. 1, 1966, abandoned. This application Aug. 20, 1974, Ser. No. 499,039

The portion of the term of this patent subsequent to Jun. 15, 1988, has been disclaimed.

Int. Cl.[2] B05D *1/18*

U.S. Cl. 427—435 **22 Claims**

1. A process for applying a coating to a metallic surface comprising:

(a) immersing a metallic surface in an aqueous acidic organic coating composition comprising, in coating-forming proportions, water, hydrogen ion, an oxidizing agent which contains oxygen, and an organic, water-dispersible, film-forming polymeric resinous material dispersed in the coating composition;

(b) depositing said resinous material on said surface to form thereon a resinous coating while said surface is immersed in said composition; and

(c) maintaining said surface in said composition and depositing thereon additional resinous material to thereby produce a resinous coating, the thickness of which increases during the time said surface is immersed in said composition; and

(d) withdrawing the resinous-coated surface from said composition after the desired amount of resinous coating has been deposited on said surface; wherein said composition will produce said coating on said metallic surface in the absence of any electrical charge on said metallic surface other than that imparted thereto by said composition, and wherein said composition is sufficiently acidic to effect an increase in the amount of resinous coating deposited for a period of at least about 10 minutes from the time said metallic surface is immersed in said composition; and wherein said resinous coating is adherent from the time it deposits on the surface and is resistant to removal by rinsing with water after it is withdrawn from said composition.

4,104,425

POWER CELL DRIVEN BY A GASEOUS OR LIQUID PRESSURE MEDIUM

Georg Hirmann, Zürich, Switzerland, assignor to Rudolf Felix Homberger, Schaffhausen, Switzerland

Filed Mar. 16, 1977, Ser. No. 778,253

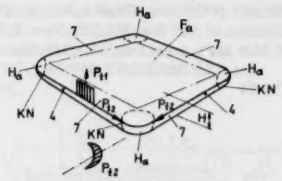
Int. Cl.[2] A47C *27/08;* **B63C** *7/10*

U.S. Cl. 428—12 **12 Claims**

1. A hollow body device for displacing masses by filling the device with pressurized fluid comprising:

a pair of like upper and lower planar segments, the periphery of said segments including rectilinear side portions, the like side portions being aligned and the shape of the segments being substantially unvarying as the device is pressurized;

a plurality of wall segments, each of said wall segments interconnecting respective ones of said aligned side portions of the planar segments, said wall segments varying in shape as the device is pressurized for providing a lift between the upper and lower segments and the wall segments developing part of a curved wall surface of a circular cylinder when the device is pressurized, the axis of the cylinder being orthogonal to the operational direction of the lift; and



corner segments interconnecting adjoining ones of said wall segments, said corner segments varying in shape without substantial kinking as the device is pressurized.

4,104,426

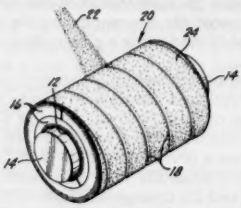
PRODUCTION OF MUFFLER MATERIAL

Rodolfo Gonzalez, Palos Verdes Estates, and Allen P. Penton, III, Costa Mesa, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Nov. 28, 1975, Ser. No. 636,291

Int. Cl.[2] E04B *1/99;* **G10K** *11/04*

U.S. Cl. 428—36 **9 Claims**



1. A muffler material having good sound absorption characteristics, high temperature and chemical resistance, and having structural rigidity when exposed to engine heat, vibration and exhaust gas pressures, consisting essentially of a ring shaped blanket of alumina-silica fibers impregnated along the inside and outside surfaces thereof, and on opposite ends thereof with a silica binder.

2. A muffler material as defined in claim 1, said alumina-silica fibrous blanket containing about 40 to about 50% alumina and about 50 to about 60% silica, by weight, the silica binder content of the coated or impregnated fibrous blanket ranging from about 5 to about 50% by weight.

3. A muffler material as defined in claim 2, said ring shaped blanket of alumina-silica fibers being cylindrical in shape, the silica binder content of the cylindrical fibrous blanket along the length thereof ranging from about 10 to about 20%, and at the ends thereof ranging from about 30 to about 40% silica binder by weight.

4,104,427

LAMINATED LIGHT-TRANSMITTING FIRE-SCREENING PANEL

Hans-Henning Nolte, Gelsenkirchen, Fed. Rep. of Germany; Marcel De Boel, Chatelineau, and Pol Baudin, Fontaine-l'Eveque, both of Belgium, assignors to BFG Glassgroup, Paris, France

Filed Aug. 10, 1976, Ser. No. 713,181

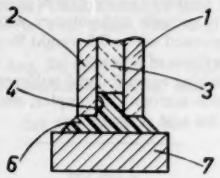
Claims priority, application United Kingdom, Aug. 22, 1975, 34950/75

Int. Cl.[2] B32B *1/04, 17/00*

U.S. Cl. 428—68 **9 Claims**

1. A laminated light-transmitting fire-screening panel com-

prising two outer nitreous plies, each having an inner face and at least one layer of intumescent material bonded to each said inner face over an area which is less than the total surface area of at least one of said inner faces of one of said outer plies to define therewith at least one recess leading along at least a



portion of the edge of said panel, frame means having a portion inserted in said recess for holding said panel so that upon swelling of said layer, at least one of said plies is free to move away from the other ply, said frame means also including sealing means in said recess for protecting the intumescent material against contact with the atmosphere.

4,104,428

CROSSLINKED MOLDED PILE PRODUCT

William Chang Liu, Northbrook, Ill., assignors to Brunswick Corporation, Skokie, Ill.

Filed Dec. 9, 1974, Ser. No. 531,183
Int. Cl.[2] B29D *7/20;* **D06N** *7/04*
U.S. Cl. 428—85 **23 Claims**

1. A molded pile product comprising a base and a plurality of fibers extending from the base, said fibers:
(a) having an aspect ratio greater than 10,
(b) having been shaped in a mold,
(c) being formed from a molding composition including a crosslinkable polymeric material which is crosslinked during formation of said fibers, and
(d) exhibiting no material deformation or elongation due to their removal from the mold.

18. A molded pile product comprising a base and a plurality of fibers extending from the base, said fibers having:
(a) an average diameter measured at the base ranging between 0.01 and 0.05 centimeters,
(b) an average length ranging between 0.01 and 5 centimeters,
(c) a density of from 0.10 to 0.50, and
(d) an aspect ratio greater than 10, said fibers having been:
(e) shaped in a mold
(f) formed from a molding composition including a crosslinkable polymeric material which is crosslinked during formation of said fibers and, after being crosslinked, has an elastic modulus ranging between 50 and 14,000 kilograms per square centimeter, and
(g) given no material permanent deformation or elongation due to their removal from the mold.

4,104,429

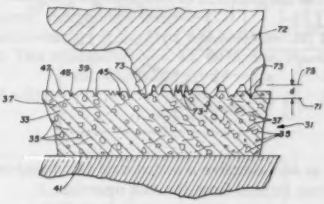
BRANDED WOOD BASED COMPOSITION BOARD PRODUCT

Gary C. Colledge, P. O. Box 2178, Newport Beach, Calif. 92663

Continuation-in-part of Ser. No. 598,772, Jul. 29, 1975, Pat. No. 4,007,767. This application Feb. 9, 1977, Ser. No. 767,055
Int. Cl.[2] B32B *21/06*
U.S. Cl. 428—151 **4 Claims**

1. A wood based composition board product for use in the fabrication of articles such as furniture, doors, panels and the like including a solid body formed from wood based components held together by binder means and having a relatively hard outer surface, wherein the improvement in said composition board product is comprised of:

said outer surface being permanently compressed in selected areas to form an intricate pattern of recesses therein, said pattern of recesses being formed as a wood grain simulating pattern extending over substantially the entire area of said outer surface, and substantially all of said recesses being charred to produce a discolored appearance as compared to the color of said outer surface intermediate said recesses.

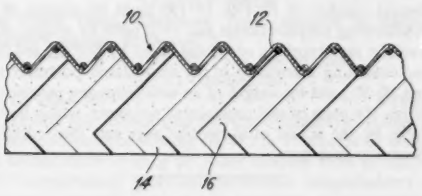


4,104,430

VACUUM FORMABLE MATERIALS

Sidney Desmond Fenton, Lancashire, England, assignor to Storey Brothers and Company Limited, Lancaster, England

Filed Jun. 2, 1975, Ser. No. 583,126
Int. Cl.[2] B32B *5/02, 5/18*
U.S. Cl. 428—175 **9 Claims**



1. A vacuum formed laminate from a material comprising:
a. a stretchable fabric having a ready stretchability of at least 20% in at least about one direction under a 5 lb load for a 2 inch wide strip,
b. a cast plasticized vinyl chloride polymer layer which is 0.1 to 2 mm thick, and
c. sandwiched between said fabric and said layer, a plastic foam layer which is from 1 to 20 mm thick.

4,104,431

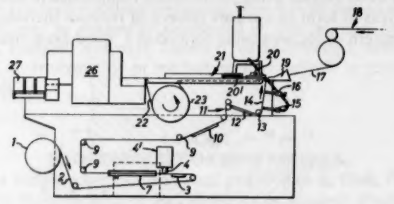
POROUS WRAPS FOR SMOKING ARTICLES

John Anthony Luke, Romsey, England, assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Division of Ser. No. 709,346, Jul. 28, 1976, Pat. No. 4,036,114. This application May 12, 1977, Ser. No. 796,252
Int. Cl.[2] B05D *1/38, 5/10*
U.S. Cl. 428—211 **5 Claims**

1. A method of treating porous wrapping material to be incorporated in the filter structure of a smoking article, wherein the porous material is provided with at least one impervious region by applying a coating of a film-forming substance at a region positioned to coincide with a region at which adhesive is to be applied, which substance is dried before such adhesive is applied, said film-forming substance

being at least the same width as said adhesive, said film-forming substance being applied to the same face of the wrapping



material as said adhesive is added, said face being on the inside of the wrap formed from the said material.

4,104,432

PLASTIC ARTICLES HAVING ON THE SURFACE THEREOF A PROTECTED METAL FILM

Katsuhide Manabe, Ichinomiya; Jiro Masumi, Aichi; Tomotada Tochitani, Ichinomiya, and Kenzo Shinoda, Gifu, all of Japan, assignors to Toyoda Gosei Kabushiki-Kaisha (Toyoda Synthetics Co., Ltd.), Japan

Filed Jun. 28, 1976, Ser. No. 700,117

Claims priority, application Japan, Jun. 30, 1975, 50-80074

Int. Cl.[2] B32B *15/08*

U.S. Cl. 428—216 **8 Claims**

1. A molded plastic article having on the surface thereof a metal film coated with the following protective layers in any order of (a) a layer applied from a mixture consisting essentially per 100 parts by weight of an acrylic copolymer of a lower alkyl ester of acrylic or methacrylic acid and a lower hydroxyalkyl ester of acrylic or methacrylic acid and having a hydroxyl number of 10–150, 10–150 parts by weight of an anti-yellowing polyisocyanate and 2–10 parts by weight of an ultraviolet ray-absorbing agent and cured by heating and (b) a layer consisting essentially of an unsaturated polyester and about 10–80 parts by weight of an anti-yellowing polyisocyanate per 100 parts of said unsaturated polyester, which layer is curable by the action of ultraviolet rays and then cured by exposure to such rays.

4,104,433

FLAME RETARDANT, NON-DRIPPING COATING COMPOSITION COMPRISING CROSSLINKABLE COPOLYMERS OF DIHYDRIC PHENOLS WITH BIS CHLOROALKYL OXETANES

James P. Kirk, Seeley Lake, Mont., and Robert L. Wear, West St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

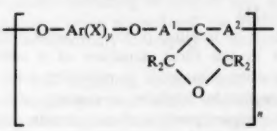
Filed Jan. 2, 1976, Ser. No. 645,956

Int. Cl.[2] C08G *65/00;* **B32B** *25/08, 25/10, 27/12;* **C08G** *65/00;* **B32B** *25/08, 25/10, 27/12*

U.S. Cl. 428—245 **9 Claims**

1. A char-forming, flame-retardant polymeric composite sheet comprising a flexible polymeric substrate having adhered thereto and substantially coextensive with at least one major surface thereof the char-forming, flame retardant coating of a composition comprising

(a) a condensation polymer consisting essentially of repeating units having the formula



wherein

Ar is a monocyclic or bicyclic aromatic nucleus,

X is halogen,

y is an integer from 1 to 8,

A^1 and A^2 are lower aliphatic radicals containing 1 to 6 carbon atoms,

R is independently hydrogen or lower alkyl of 1 to 6 carbon atoms, and

n is an integer representing the degree of polymerization and is selected to provide said polymer with an inherent viscosity, determined with a 0.5 weight % solution in 1,1,2,2-tetrachloroethane of at least 0.1,

(b) a crosslinking agent for said polymer comprising stannic chloride-acetonitrile complex, and

(c) solvent for said polymer.

4,104,434

SIZING COMPOSITION AND GLASS FIBERS SIZED THEREWITH

Carl A. Johnson, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 438,041, Jan. 30, 1974, abandoned, which is a continuation of Ser. No. 203,012, Nov. 29, 1971, abandoned. This application Jan. 23, 1976, Ser. No. 651,754

Int. Cl.[2] B32B *17/02, 17/06*

U.S. Cl. 428—273 **11 Claims**

1. At least one glass fiber coated with a composition comprising a water emulsifiable resin system and an emulsifiable lubricant in a ratio by weight of about 1:2 to about 2:1 respectively, a water-soluble, volatile aliphatic monocarboxylic acid containing from 1 to 8 carbon atoms and an aliphatic polycarboxylic acid containing from 2 to 9 carbon atoms.

4,104,435

SPONGE

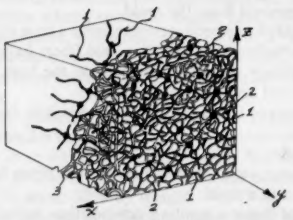
Juan Carlos Corral Ballesteros, Buenos Aires, Argentina, assignor to Suilene Argentina S.A., Buenos Aires, Argentina

Filed May 11, 1977, Ser. No. 795,753

Claims priority, application Argentina, May 28, 1976, 263437

Int. Cl.[2] D04H *1/68;* **B32B** *3/26, 5/20*

U.S. Cl. 428—288 **5 Claims**



1. A sponge comprising:

a. a three-dimensional fibrous reticular structure formed of a plurality of fibers randomly arranged in a three-dimensional relationship to provide a predetermined fiber density, at least some of said fibers being connected to each other at points where said fibers intersect;

b. a body of compressibly resilient foamed material formed around said fibrous reticular structure to fill spaces in said structure and engulf said structure, said foamed material being intimately bonded to said fibers to form an integral and resilient sponge combining said fibrous structure with said foamed material so that said fibrous structure moves resiliently with said foamed material;

c. portions of said fibers extending outward from at least one surface of said sponge;

d. said fibrous structure being stronger and more abrasive than said foamed material; and

e. the ratio by weight of said foamed material relative to

total weight of said sponge including said fibrous structure ranging from 20 to 80%.

4,104,436

MAGNETIC HEAD CLEANING ARTICLE

Osamu Suzuki; Masaki Ueda, and Akira Ishii, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 30, 1974, Ser. No. 501,957

Claims priority, application Japan, Aug. 31, 1973, 48-102259[U]

Int. Cl.² B32B *21/06*

U.S. Cl. 428—297 **19 Claims**

1. An article for cleaning a magnetic head comprising a support having a Japanese paper laminated thereon, the Japanese paper consisting of the bast fibers of natural vegetable fibers having a fiber length of about 5 mm or longer and an average fiber diameter of about 10 μ to 40 μ.

4,104,437

PRESSURE-SENSITIVE COPY SYSTEM INCLUDING UREIDO FLUORAN CHROMOGENIC COMPOUNDS

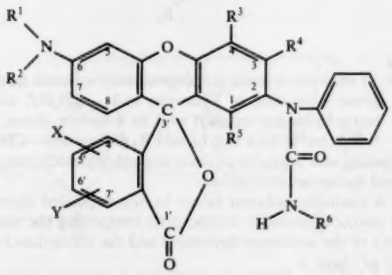
David N. Vincent, San Diego, Calif., and Cheng-Hsiung Chang, Naperville, Ill., assignors to Champion International Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 508,834, Sep. 24, 1974, abandoned. This application Sep. 8, 1975, Ser. No. 611,205

Int. Cl.² B32B *3/26*

U.S. Cl. 428—307 **10 Claims**

1. A pressure-sensitive copy system comprising a substrate bearing pressure-rupturable microcapsules containing a chromogenic compound having the formula



wherein

R^1 and R^2 each represent an alkyl group;

R^3 and R^4 each represent a hydrogen atom; a halogen atom, an alkyl group, a nitro group, an amino group, an acyl group, or a carboalkoxy group;

R^5 represents a hydrogen atom or an alkyl group, with the proviso that R^5 represents an alkyl group only when R^4 represents a hydrogen atom;

R^6 represents an alkyl group, an aryl group or an aralkyl group; and

X and Y each represent a hydrogen atom, a halogen atom, a nitro group, a lower alkyl group, an aryl group, an alkoxy group, or a carboalkoxy group.

4,104,438

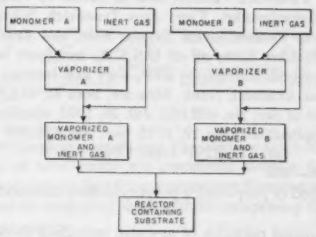
GAS-BARRIER COATED FILMS, SHEETS OR FOILS AND METHOD OF PREPARATION

Rudolph John Angelo; Richard Nelson Blomberg, both of Wilmington; Fritz Peter Boettcher, Newark, all of Del.; Richard Masayoshi Ikeda, Chadds Ford, Pa., and Michael Robert Samuels, Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 542,237, Jan. 20, 1975, abandoned. This application Nov. 12, 1975, Ser. No. 630,996

Int. Cl.² B32B *27/34*

U.S. Cl. 428—332 **3 Claims**



1. An organic polymeric film having a gas-barrier coating thereon of an aromatic polyamide consisting essentially of units p-phenylene diamine and terephthalic acid having a density greater than about 1.42, a planar X-ray orientation and an electron microscope morphology of a coalesced particulate texture.

4,104,439

TEXTILE FIBER

John Frank Fuzek, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 31, 1977, Ser. No. 802,089

Int. Cl.² D02G *3/00*

U.S. Cl. 428—397 **4 Claims**

1. Textile fiber comprising poly(1,4-cyclohexylenedimethylene terephthalate) containing about 2 to 15 percent by weight of a second fiber forming polyester selected from poly(ethylene terephthalate), poly(tetramethylene terephthalate) or copolyester thereof, present as microfibrils, the microfibrils having diameters of 50-150A in cross section and 500-1000A in length, in the poly(1,4-cyclohexylenedimethylene terephthalate), said fiber having a luster similar to degummed and bleached silk fibers as determined by Goniophotometric luster curves, and said fiber has a non-round cross section.

4,104,440

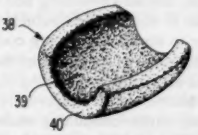
METHOD FOR MAKING PACKAGING PARTICLES AND RESULTING PRODUCT

Frederick H. Collins, Thousand Oaks, Calif., assignor to Valcour Imprinted Papers, Inc., Glens Falls, N.Y.

Division of Ser. No. 632,073, Nov. 14, 1975, Pat. No. 4,042,658. This application Mar. 2, 1977, Ser. No. 773,672

Int. Cl.² B32B *27/00*

U.S. Cl. 428—402 **5 Claims**



1. A sheet-like packaging particle comprised of a polymer-

ized vinyl aromatic monomer formed with a normally curved configuration having two spaced apart, curved, substantially coextensive surfaces, one of said surfaces being concave and comprising a substantially unfoamed skin and the remainder of said particle including the other said surface being foamed.

4,104,441

POLYCRYSTALLINE DIAMOND MEMBER AND METHOD OF PREPARING SAME

Dmitry Valerianovich Fedoseev; Boris Vladimirovich Deryagin, both of Moscow; Valentin Nikolaevich Bakul; Alexei Iosifovich Prikhna, both of Kiev; Valentin Pavlovich Varnin; Stanislav Pavlovich Vnukov, both of Moscow; Valentin Korneevich Gerasimenko, Kiev; Jury Ivanovich Nikitin, Kiev; Nekhemyan Veniaminovich Tsypin, Kiev, and Anatoly Vasilievich Hochko, Kiev, all of U.S.S.R., assignors to Institut Sverkhtverdykh Materialov SSR, Kiev and Institut Fizicheskoi Khimii Akademii Nauk, Moscow, both of, U.S.S.R.

Continuation of Ser. No. 600,080, Jul. 29, 1975, abandoned. This application May 19, 1976, Ser. No. 688,003

Int. Cl.[2] B29F *5/00*; C04B *31/16*

U.S. Cl. 428—408 **2 Claims**

1. A method of preparing a polycrystalline diamond member comprising:

using diamond particles of any size including those smaller than one micron, said particles having substantially identical size;

epitaxially coating said particles in a flow of a carbonaceous medium to deposit both diamond and diamond-graphite coating on said particles;

interrupting said coating at a predetermined moment prior to the formation of a pure graphite layer on the particles;

bringing said particles into mechanical contact with one another and sintering them under a pressure of at least 40 kbar and at a temperature of at least 1000° C for a time sufficient for effecting phase conversions of the diamond-graphite material in the zones of contact of the diamond-graphite coatings of neighboring particles into diamond so as to strongly bind all particles into a single compact body.

2. The polycrystalline diamond member prepared as claimed in claim **1**, containing a plurality of diamond particles bound into a single compact body, wherein the binder consists of diamond zones substantially free from graphite which are formed as a result of phase conversion in the zones of contact of diamond-graphite coatings of various neighbouring particles.

4,104,442

SILICON NITRIDE-CONTAINING MATERIAL WITH SELF-GLAZING SURFACE AND PROCESS FOR ITS PRODUCTION

Godehard Sussmuth, Selb, Bazen, Fed. Rep. of Germany, assignor to Rosenthal AG, Fed. Rep. of Germany

Filed Mar. 23, 1976, Ser. No. 669,654

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1975, 2544437

Int. Cl.[2] B32B *13/04*

U.S. Cl. 428—428 **5 Claims**

1. A process for the production of a silicon nitride-containing material with a gas-tight surface and improved oxidation resistance which comprises admixing 3–25 percent by weight based on the weight of the resulting admixture of at least one powdered ceramic, silicate-containing additive having a particle size of less than 20 mμ and the silicon raw material, subjecting the admixture to standard nitriding condition and subjecting the nitrided admixture to a heat treatment between 1,000° C and 1,500° C in an oxygen-containing atmosphere, wherein said admixture is heated to said temperature at a rate exceeding 100° C per minute, nitride-containing material.

5. A silicon nitride-containing body having a gas tight surface and improved resistance to oxidation produced by the process of claim **1**.

4,104,443

ANTISTATIC FINISH FOR TEXTILES MATERIAL

Bruce M. Latta, Wayne; Catherine V. Stevens, Closter, and Bruce E. Dennis, Clifton, all of N.J., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

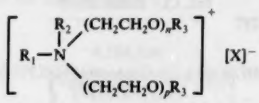
Filed May 6, 1977, Ser. No. 794,575

Int. Cl.[2] B44D *1/22*

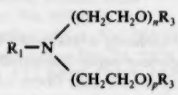
U.S. Cl. 428—474 **10 Claims**

1. A process of imparting durable antistatic properties to synthetic polymer fabric which comprises applying to said fabric an aqueous composition containing

(A) an ethoxylated compound selected from the group consisting of compounds having the formula



and



wherein

R_1 is an alkyl group of 8 to 22 carbon atoms;

R_2 is an alkyl group of 1 to 22 carbon atoms or $—(CH_2CH_2O)_rR_4$;

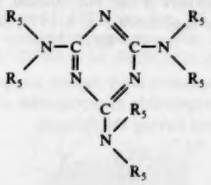
R_3 is hydrogen, $—CH_2CH_2NH_2$ or $—CH_2CH_2SH$;

R_4 is hydrogen, $—CH_2CH_2NH_2$, $—CH_2CH_2SH$ or an alkyl group of 1 to 4 carbon atoms;

n, p and r are integers of from 5 to 60, and

X^- is an anion and

(B) A melamine derivative of the formula



where

R_5 at each occurrence is independently selected from the group consisting of hydrogen and $—CH_2OZ$ with Z being hydrogen or alkyl of 1 to 4 carbon atoms, provided that at least two of said R_5 groups are $—CH_2OZ$,

and heating said fabric to coreact said ethoxylated compound and said melamine derivative.

10. A synthetic polymer fabric having deposited thereon a water insoluble antistatic composition comprising the reaction product of the melamine derivative and the ethoxylated compound of claim **1**.

4,104,444

FIBER REINFORCED CHEMICALLY MODIFIED PROTEIN ARTICLES

Klaus-Dieter Hammer, Mainz; Günter Gerigk, Oberursel, and Max Bytzek, Naurod, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 31, 1976, Ser. No. 719,257

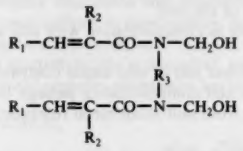
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1975, 2539302

Int. Cl.[2] A22C *13/00*; B29D *23/01*; C07G *7/00*

U.S. Cl. 428—474 **29 Claims**

1. A process for the manufacture of a fiber-reinforced article

which comprises the steps of (a) applying to a fibrous material a reaction liquid comprising a modified protein which has been modified by reaction with at least one compound of the formula III

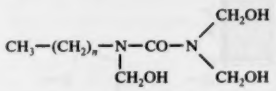


III

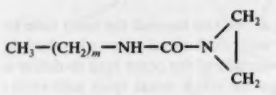
in which R_1 and R_2, which may be the same or different, represent hydrogen or an alkyl group having 1 to 6 carbon atoms, and R_3 represents a $(CH_2)_p$ group, in which p represents an integer from 1 to 8 inclusive, or a

group

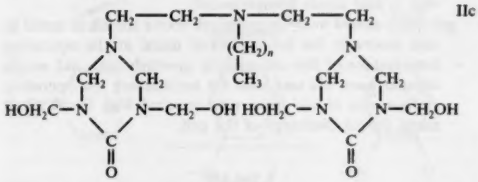
in which R_4 represents an alkyl group containing from 1 to 18 carbon atoms, and at least one compound of the formulae IIa, IIb, IIc or IId



IIa

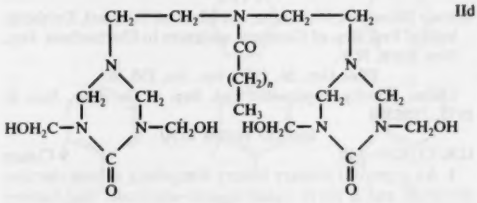


IIb



IIc

or



IId

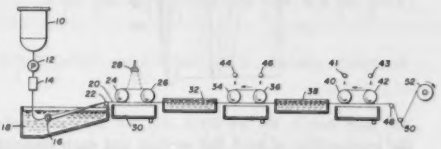
in which formulae n represents an integer between 9 and 24, inclusive, and m represents an integer between 11 and 19, inclusive, and which is a reaction product obtainable by reacting a protein solution containing about 3 to 16% by weight of a protein the pH value of which is sufficiently high to insure the dissolution of the protein with a liquid formulation containing about 5 to 30% by weight of at least one compound of the formulae IIa, IIb, IIc or IId, and a solution containing about 1 to 30% by weight of at least one compound of the formula III at a temperature and for a period of time sufficient to form the modified protein, to produce a coated and/or impregnated product, (b) passing said product into a liquid precipitating agent for the modified protein and (c) treating the product of step (b) with a cross-linking agent comprising at least one saturated organic compound containing at least two reactive OH groups, at least two reactive NH_2 groups or at least one reactive NH_2 and at least one reactive OH group.

4,104,445

METHOD FOR MAKING STEEL WIRE

Emerick J. Dobo, Cary, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 20, 1975, Ser. No. 624,076
Int. Cl.[2] B22F *3/00, 1/00*
U.S. Cl. 428—567 **12 Claims**



1. A method for producing filamentary steel wire wherein particles of iron oxide are combined with a fiber-forming acrylic polymer to first form a precursor filament which is then converted to steel wire, said method comprising the following steps in sequence:

(A) providing a spinning dope wherein particles of iron oxide having an average diameter of about 5 microns or less are uniformly dispersed within a solution of acrylic polymer with the weight ratio of iron oxide to acrylic polymer being within the range of from about 3:1 to 7:1 respectively;

(B) forming a precursor filament by extruding said dope through a spinnerette and into a coagulation bath; and

(C) converting said precursor filament to filamentary steel wire by subjecting the filament to a temperature in the range of from 900° C. to 1150° C. for a period of from about 3 to 8 minutes while being exposed to a gaseous atmosphere consisting of from about 80 to 94 percent by volume of hydrogen, from about 2 to 15 percent by volume of carbon monoxide and from 0 to 10 percent by volume of a gaseous hydrocarbon.

9. A synthetic filament which is convertible to filamentary steel wire when exposed to a reducing environment at temperatures in the range of from about 900° C. to 1150° C. for a period of from 3 to 8 minutes, said synthetic filament comprising a mixture of iron oxide particles and an acrylic polymer in a weight ratio of from about 3:1 to 7:1, respectively.

10. A filamentary steel wire product obtained from the reduction, carbonization and sintering of iron oxide particles which has a tensile strength of at least 140,000 psi, said steel wire product being further characterized by an essentially ferritic-pearlitic structure and a carbon content of from about 0.6 to 0.8 percent by weight.

4,104,446

SELF-TAPPING OR THREAD-FORMING SCREW

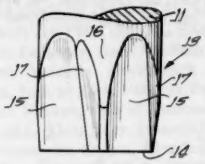
Lawrence D. Johnson, Rockford, Ill., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.

Continuation of Ser. No. 588,292, Jun. 19, 1975, abandoned, which is a continuation of Ser. No. 489,413, Jun. 17, 1974, abandoned, which is a continuation of Ser. No. 196,431, Nov. 8, 1971, abandoned. This application Sep. 14, 1976, Ser. No. 723,329
Int. Cl.[2] B21H *3/02, 3/10*
U.S. Cl. 428—585 **1 Claim**

1. A blank for use in the manufacture of a thread-forming screw product by the process of rolling a constant root diameter thread on said blank, said blank comprising, in combination:

an enlarged head, a cylindrical body with a longitudinal axis, and a tapered, generally conical point merging into the body at an upper edge, said conical tapered point being formed with a taper of approximately 4° from the longitu-

dinal axis and with four equi-spaced, flat surfaces, each of said flat surfaces formed at an angle of 8°–10° from the longitudinal axis, said point further being formed with four equi-spaced additional flat surfaces, each one of said flat surfaces being in a counterclockwise direction from an associated one of said additional flat surfaces when said blank is viewed as an end elevation of the tapered point,



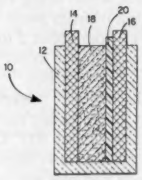
the intersection of each flat surface and each associated additional flat surface defining a leading edge, each additional flat surface forming an angle of approximately 33° relative to the associated flat surface, said flat surfaces and said additional flat surfaces extending upward along the point and merging into the shank at approximately the upper edge of the point.

4,104,447

HALOGEN COMPLEXING ALKYL SALTS FOR USE IN HALOGEN CELLS

Fraser M. Walsh, Arlington; Dennis N. Crouse, Melrose, and Alfred M. Ajami, Boston, all of Mass., assignors to Eco-Control, Inc., Cambridge, Mass.

Filed Sep. 26, 1977, Ser. No. 836,553
Int. Cl.[2] H01M 8/22
U.S. Cl. 429—15 **26 Claims**



1. A process for improving the performance of current delivering electrochemical systems of the type which utilize a substance selected from the group consisting of bromine, chlorine, iodine, and mixtures thereof as their electrochemically active agent, said process comprising adding to the electrolyte of said system, at least one halogen complexing compound which exists as a substantially water insoluble liquid at the operating temperature of the system in the presence of one or more equivalents of halogen, said compound being selected from the group consisting of alkyl (C_1-C_7) and haloalkyl (C_1-C_7) substituted quaternary ammonium salts having a cationic nitrogen symmetry number no greater than three and a halide counterion.

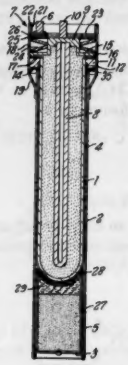
4,104,448

ALKALI METAL-SULPHUR CELLS

John George Gibson, Whatstandwell, and Alec Roger Tilley, Blackbrook, nr. Belper, both of England, assignors to British Railways Board, London, England

Filed Oct. 8, 1976, Ser. No. 730,771
Int. Cl.[2] H01M 10/38
U.S. Cl. 429—72 **10 Claims**

1. An alkali metal sulphur cell comprising:
an outer tube;
an inner tube forming the solid electrolyte of the cell and dividing the interior of the outer tube into anode compartment and cathode compartment adjacent respective sides of the inner tube; said anode containing alkali metal; said cathode containing sulphur material;
the annular space between the outer tubes constituting the anode compartment of the cell;
an alkali metal reservoir in communication with said anode compartment;
means located at the lower end of said anode compartment for defining an inlet and communicating passage to said anode compartment from said alkali metal reservoir;



the outer tube extending at one end beyond the inner tube to provide a housing for said alkali metal reservoir which is spaced from the inner surface of the outer tube to define a communicating passage for alkali metal from said reservoir to said anode compartment;
gas space closed to the atmosphere above the alkali metal in said reservoir for forcing alkali metal at the operating temperature of the cell to flow upwards into said anode compartment via said inlet for maintaining the operative surface area of said inner tube covered with liquid alkali metal during discharge of the cell.

4,104,449

PRIMARY BATTERY OF THE REMOTELY ACTIVATED TYPE

Werner Böhnstedt, Rheinberg, and Manfred Stommel, Duisburg, both of Fed. Rep. of Germany, assignors to Electrochem, Inc., New York, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,367
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1975, 2550304
Int. Cl.[2] H01M 6/30
U.S. Cl. 429—110 **9 Claims**

1. An improved primary battery comprising at least one zinc electrode and a silver oxide counter-electrode, said battery including acid in aqueous solution as a battery-activating electrolyte.

4,104,450

ALKALI METAL BATTERIES HAVING ELECTROLYTES INCLUDING ALKALI METAL SALTS OF COMPLEX ANIONS CONTAINING HETEROATOM SUBSTITUENTS IN ORGANIC SOLVENT

Thomas A. Whitney, Roselle, and Lawrence P. Klemann, Somerville, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Aug. 24, 1977, Ser. No. 827,133
Int. Cl.[2] H01M 6/14
U.S. Cl. 429—194 **64 Claims**

1. In an electrochemical cell which contains an alkali metal

anode, a cathode and a non-aqueous electrolyte, the improvement comprising:

using as said electrolyte one which includes:

(a) an organic solvent selected from the group consisting of inertly substituted and unsubstituted ethers, sulfones, organic sulfates, organic sulfites, organic nitrites and organic nitro compounds; and,

(b) electrolytically active alkali metal salts including alkali metal complex anion salts having the formula:

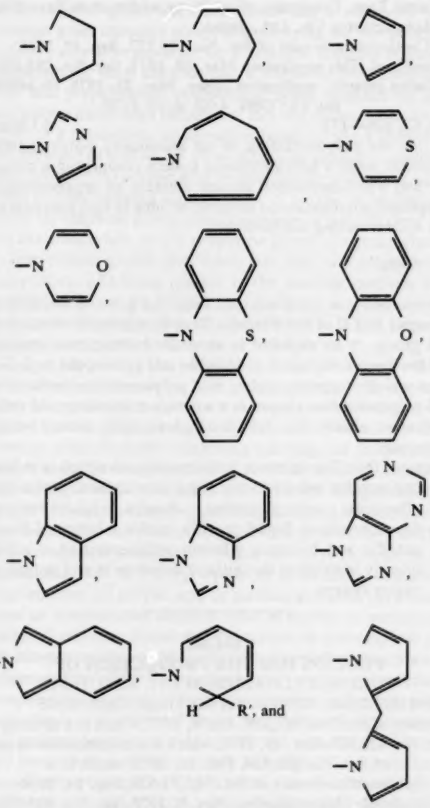
$$ZMR_xQ_y$$

wherein Z is an alkali metal;

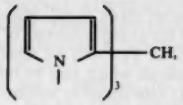
wherein M is a metal selected from the group consisting of Zn, Cd, B, Al, Ga, Sn (stannous), In, Tl, P, and As;

wherein R represents x number of radicals which may be the same or different and are inertly substituted or unsubstituted organic radicals selected from the group consisting of alkyl radicals having 1 to 20 carbon atoms, aryl radicals having 6 to 18 carbon atoms, alkaryl and aralkyl radicals having 7 to 25 carbon atoms and naphthenic radicals having 3 to 10 carbon atoms,

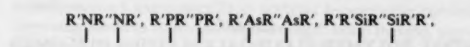
wherein Q represents heteroatom substituents selected from the group consisting of:



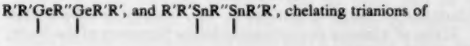
and any dimeric or trimeric composite of the foregoing radicals, and any group composed of two or three of the above structural units linked directly or through additional carbon (methylene);



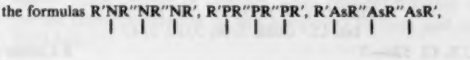
—NR′R′, —PR′R′, —AsR′R′, —SiR′R′R′, —GeR′R′R′, —SnR′R′R′, chelating dianions of the formulas



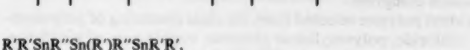
R′R′GeR″GeR′R′, and R′R′SnR″SnR′R′, chelating trianions of



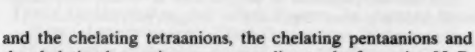
the formulas R′NR″NR″NR′, R′PR″PR″PR′, R′AsR″AsR″AsR′,



R′R′SiR″Si(R′)R″SiR′R′, R′R′GeR″Ge(R′)R″GeR′R′, and



R′R′SnR″Sn(R′)R″SnR′R′,



and the chelating tetraanions, the chelating pentaanions and the chelating hexaanions corresponding to the foregoing N, P, As, Si, Ge and Sn trianion formulas, wherein each of the R's are the same or different and are selected from the group consisting of unsubstituted and inertly substituted organic radicals consisting of alkyl radicals having 1 to 20 carbon atoms, aryl radicals having 6 to 18 carbon atoms, aralkyl and alkaryl radicals having 7 to 25 carbon atoms and naphthenic radicals having 3 to 10 carbon atoms, and wherein each of the R″s are the same or different and are selected from the group consisting of (1) hexa- and penta-cycloaliphatic and aromatic radicals and their lower alkyl derivatives wherein said radicals are attached in the above Q heteroatom substituents at 1,2- or 1,3- positions on the cycloaliphatic rings and at the 1,2-positions on the aromatic rings, and (2) 2 and 3 methylenic radicals, wherein each methylenic radical contains 0 to 2, monovalent hydrocarbon radicals of 1 to 6 carbon atoms;

wherein x is zero or a positive integer; and

wherein y is a positive integer;

subject to the proviso that the sum of x plus y is equal to one plus the valence of the metal M, that x is equal to the number of R radicals present and that y equals the total valence of all Q radicals present.

4,104,451

ALKALI METAL ANODE/CHALCOGENIDE CATHODE REVERSIBLE BATTERIES HAVING ALKALI METAL POLYARYL METALLIC COMPOUND ELECTROLYTES

Lawrence P. Klemann, Somerville, and Gerald H. Newman, Westfield, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Sep. 26, 1977, Ser. No. 836,314

Int. Cl.[2] H01M *6/14*

U.S. Cl. 429—194 **19 Claims**

1. In an electrochemical cell which contains an alkali metal anode, a metal chalcogenide cathode and a non-aqueous electrolyte, the improvement comprising:

using as said electrolyte one which consists essentially of:

(a) an organic solvent selected from the group consisting of inertly substituted and unsubstituted ethers, sulfones, organic sulfates, organic sulfites, organic nitro compounds and organic nitrites; and,

(b) electrolytically active alkali metal salts including an electrolytically active amount of a polyaryl metallic alkali metal salt having the formula:

ZMR_n

wherein Z is an alkali metal, wherein M is a metal selected from the group consisting of Zn, Cd, B, Al, Ga, Sn (stannous), In, Tl, P and As, wherein R represents *n* number of radicals which may be the same or different and are inertly substituted or unsubstituted aryl radicals selected from the group consisting of aryl radicals having 6 to 50 carbon atoms, and wherein *n* is a numerical value equal to one plus the valence of the metal M.

4,104,452
VINYL POLYMER-FLUOROALKYLETHER OLIGOMER COMPOSITION

Marianne K. Bernett, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 6, 1977, Ser. No. 839,946
Int. Cl.[2] C08K *5/06, 5/20, 5/42*
U.S. Cl. 526—3 **8 Claims**

1. A vinyl polymer-fluorolkylether oligomer composition which comprises:

a vinyl polymer selected from the class consisting of polyvinylchloride, polyvinylidene chloride, copolymers of vinylidine chloride and vinyl chloride, copolymers of vinylidene chloride and acrylonitrile in proportions in which vinylidene chloride is at least 70 percent by weight, polymethylmethylmethacrylate, and polystyrene; and from 0.05 weight percent based on total composition weight to the dispersibility limit of a fluoroalkylether oligomer of the general formula:

$$F[C(CF_3)F—CF_2—O]_m\text{-}\ C(CF_3)F—CO—R$$

wherein *m* is an integer from 4 to 10 and R is further defined by the formulas:

$$OR^1(OR^2)_nOR^2 \quad (1)$$

wherein R^1 is an alkyl radical having from 1 to 3 carbon atoms, R^2 is an alkyl radical having from 1 to 3 carbon atoms, and *n* is an integer from 3 to 10;

$$OR^3 \quad (2)$$

wherein R^3 is an alkyl having from 1 to 10 carbon atoms;

$$N—(C_pH_{2p}OH)_2 \quad (3)$$

wherein *p* is an integer from 2 to 4;

$$N\ (CH_3)_qCH_3 \quad (4)$$

wherein *q* is an integer from 2 to 8; and

$$N(R^4)C_sH_{2s}N^+(R^5)(R^6)(R^7)A^- \quad (5)$$

wherein R^4 is hydrogen or an alkyl having 1 to 3 carbon atoms, R^5 and R^6 and R^7 are alkyl groups having 1 to 3 carbonatoms, *s* is an integer from 1 to 3, andA is a sulfonate or halide, said fluoroalkylether oligomer being incorporated therein in an amount sufficient to provide a surface of lower energy thereon.

4,104,453
MELT DISPERSION SAPONIFICATION OF ETHYLENE-VINYL ACETATE POLYMER

Leo H. Broering, Fort Wright, Ky., and Gary W. Duncan, Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Jul. 5, 1977, Ser. No. 813,134
Int. Cl.[2] C08F *8/12*
U.S. Cl. 526—10 **12 Claims**

1. A process for preparing in finely divided form saponified ethylene-vinyl acetate polymer comprising the steps of heating with agitation an aqueous mixture comprised of molten ethylene-vinyl acetate polymer, a strong inorganic base, a block copolymer of ethylene oxide and propylene oxide containing at least about 50% by weight ethylene oxide and at least one other anionic dispersant selected from the group consisting of a salt of a polycarboxylic acid and a condensed arylsulfonate salt at a temperature below the decomposition temperature of the polymer and cooling the resulting dispersion to obtain the saponified product in finely divided state with the majority by weight of the particles being less than 50 microns in diameter.

4,104,454
METHOD FOR REDUCING PVC POLYMER BUILDUP IN POLYMERIZATION REACTORS

Dean R. Weimer, and Albert M. Durr, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 699,100, Jun. 23, 1976, Pat. No. 4,068,052. This application Jun. 20, 1977, Ser. No. 807,853
Int. Cl.[2] C08F *10/60*
U.S. Cl. 526—62 **7 Claims**

1. In a suspension polymerization an improved method for preventing polymer buildup in the polymerization reactor during the polymerization of vinyl chloride monomer to form polyvinyl chloride polymer and copolymers, the improved method comprising coating reactor surfaces in contact with the reaction medium with dithiooxamide prior to carrying out the polymerization.

4,104,455
POLYMERIZATION OF MONOMER

Mitsuru Nagasawa, Nagoya; Teruo Fujimoto, Chiryu, and Kazuo Tago, Tokuyama, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Continuation-in-part of Ser. No. 614,777, Sep. 19, 1975, abandoned. This application Mar. 30, 1977, Ser. No. 783,003
Claims priority, application Japan, Mar. 25, 1975, 50-34950
Int. Cl.[2] C08F *4/46, 4/48, 4/50*
U.S. Cl. 526—173 **6 Claims**

1. In the polymerization of an anionically polymerizable monomer using a polymerization system comprising a monomer and a polymerization solvent wherein an organometallic compound polymerization initiator, soluble in said polymerization system having the formula:

$$MeR_x$$

wherein Me is a metal selected from the group consisting of Groups I and II of the Periodic Test; R represents an alkyl or aryl group, or an aliphatic or aromatic hydrocarbon residue; and the integer *x* is 1 or 2; is added to said system, the improvement which comprises adding said polymerization initiator to said polymerization system as a solution comprising said polymerization initiator dissolved in a high viscosity solvent having a viscosity

greater than 1 cp at room temperature and which is at least one member selected from the group consisting of n-hexylbenzene, n-butylbenzene, decalin, 1,2,3,4-tetrahydronaphthalene, liquid paraffin, and a mixture of liquid paraffin and benzene, wherein polymerization is subsequently initiated as the initiator dissolves in said polymerization system.

4,104,456
PROCESS FOR THE PRODUCTION OF POLY(ALLYLHALIDE-ALLYL ALCOHOL)

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Division of Ser. No. 757,239, Jan. 6, 1977, which is a division of Ser. No. 622,525, Oct. 15, 1975, which is a continuation-in-part of Ser. No. 551,534, Feb. 21, 1975, which is a continuation-in-part of Ser. No. 71,628, Sep. 11, 1970, abandoned. This application Nov. 9, 1977, Ser. No. 849,856
Int. Cl.[2] C08F *4/16, 30/08, 230/08*
U.S. Cl. 526—194 **5 Claims**

1. The process for the production of poly (allyl halide allyl alcohol) copolymer by the following steps:

(a) providing a quantity of silicon acid;

(b) admixing 1 part by weight of an alkali metal carbonate, selected from the group consisting of sodium carbonate and potassium carbonate;
(c) mixing therewith 2 parts by weight of an allyl halide compound with 1 part by weight of the silicon acid;
(d) agitating said mixture in a closed system and keeping the temperature between 0 degree and 100 degree C for about 20 to 40 minutes at ambient pressure, thereby
(e) producing poly (allyl halide allyl alcohol) copolymer.

4,104,457

BULK POLYMERIZATION OF VINYL CHLORIDE TO CONTROL GRAIN SIZE

Daniel Debord, St-Auban, and Salomon Soussan, St-Fons, both of France, assignors to Rhone-Progil, Paris, France

Continuation of Ser. No. 522,571, Nov. 11, 1974, abandoned, which is a continuation of Ser. No. 322,501, Jan. 10, 1973, abandoned. This application Feb. 3, 1977, Ser. No. 765,414
Claims priority, application France, Jan. 11, 1972, 72.00766
Int. Cl.[2] C08F *2/02*
U.S. Cl. 526—203 **7 Claims**

1. In a process for the preparation of polymers and copolymers of vinyl chloride by bulk polymerization, the improvement in producing polymers and copolymers having a relatively narrow grain size distribution and a relatively large average grain diameter comprising carrying out the polymerization under low agitation of a reaction medium consisting essentially of vinyl chloride and a prepolymeric composition (A), said prepolymeric composition being obtained by polymerization under high turbulence, to a conversion of about 5 to 15%, of a monomeric composition based on vinyl chloride in the presence of 0.05 to 2% by weight of an auxiliary compound selected from (a) acrylic acid or methacrylic acid, (b) a substituted or unsubstituted aliphatic ester of acrylic or methacrylic acids, (c) ethylene glycol dimethacrylate or polyethylene glycol dimethacrylate, or (d) propylene glycol dimethacrylate or polypropylene glycol dimethacrylate with the prepolymeric composition (A) being present in the reaction medium in an amount sufficient to provide a population of polymers and copolymers having a grain size distribution in which the mean diameter is at least equal to about 150 microns.

7. In a process for the preparation of polymers and copolymers of vinyl chloride by bulk polymerization, the improvement in producing polymers and copolymers having a relatively narrow grain size distribution and a relatively large average grain diameter comprising carrying out the polymerization under low agitation of a reaction medium consisting essentially of vinyl chloride, a prepolymeric compostion (A), said prepolymeric composition being obtained by polymerization under high turbulence, to a conversion of about 5 to 15%, of a monomeric composition based on vinyl chloride in the presence of 0.05 to 2% by weight of an auxiliary compound selected from (a) acrylic acid or methacrylic acid, (b) a substituted or unsubstituted aliphatic ester of acrylic or methacrylic acids, (c) ethylene glycol dimethacrylate or polyethylene glycol dimethacrylate, or (d) propylene glycol dimethacrylate or polypropylene glycol dimethacrylate, and a prepolymeric composition (B) obtained by polymerization under high turbulence, to a conversion of about 5 to 15%, of a monomeric composition based on vinyl chloride not containing said auxiliary compound, with the contents by weight of the particles of prepolymer composition (A) in relation to the total weight of prepolymer particles in the reaction medium varying from 50 to 100% and with the prepolymeric composition (A) being present in the reaction medium in an amount sufficient to provide a population of polymers and copolymers having a grain size distribution in which the mean diameter is at least equal to about 150 microns.

4,104,458

MULTIFUNCTIONAL ACRYLATE N-VINYLAMIDE ANAEROBIC ADHESIVE COMPOSITION

Julian L. Azorlosa, Kinnelon, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Jan. 7, 1977, Ser. No. 757,473
Int. Cl.[2] C08F *124/00*
U.S. Cl. 526—264 **15 Claims**

1. A solventless, fast-setting adhesive composition consisting essentially of two monomer parts which are adapted to be copolymerized anaerobically at ambient temperature between opposing surfaces to form a high-strength bond thereto, one of said parts being an ethylenically unsaturated polymerizable multifunctional acrylate monomer and the other part an N-vinylamide monomer, one of said parts having an oxidizing agent present therein and the other part a reducing agent, said agents being capable of reacting when brought together to initiate copolymerization of said monomers to form said desired bond.

4,104,459

TREATING POLYVINYL CHLORIDE RESINS

Edwin D. Hornbaker, and Adam Nugent, Jr., both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 498,547, Aug. 19, 1974, abandoned. This application Mar. 25, 1976, Ser. No. 670,239
Int. Cl.[2] C08F *6/24, 6/00*
U.S. Cl. 528—499 **9 Claims**

1. In the method of treating particles of a polyvinyl chloride resin which have a susceptibility to degradation in dynamic thermal stability and an increase in bulk density upon prolonged heating, which have previously been subjected to a flashing step to remove a major portion of the unreacted vinyl chloride monomer therefrom, the improvement for further reducing the vinyl chloride monomer content of the resin particles comprising:

a. suspending the resin particles in an aqueous medium in a closed vessel to form a resin-water slurry;
b. indirectly applying heat to the slurry to maintain the temperature thereof in a range between about 50° C to about 95° C for a time period of from about one minute to about 120 minutes;
c. applying a continuous vacuum in the range of from about 5 in. Hg to about 26 in. Hg to produce boiling of the slurry from the heat applied to the vessel while simultaneously removing from the vessel a vapor phase containing vinyl chloride monomer and the aqueous medium; and
d. cooling the slurry to produce resin particles having a vinyl chloride monomer content of less than about 420 ppm (dry resin basis), a dynamic thermal stability of at least 7 minutes and a bulk density of at least 0.5 g/cc.

4,104,460

METHOD FOR TREATING SEAWEED WITH HYDROGEN PEROXIDE OR HYDROGEN PEROXIDE COMPOUND

Nobuyasu Hasebe, No. 24-8, 2-chome, Nishiogikita, Suginami-ku, Tokyo, Japan

Filed Sep. 14, 1976, Ser. No. 723,172
Int. Cl.[2] C08B *37/04*
U.S. Cl. 536—3 **12 Claims**

1. A method for preparing seaweed powder from seaweed which comprises treating the seaweed with hydrogen peroxide in aqueous solution in an amount sufficient to strip off the outer skin of the seaweed and then drying the seaweed which has been stripped of its outer skin.

4,104,461
2,2'-ANHYDRO-β-D-ARABINOFURANOSYL-5-FLUOROCYTOSINE

Jack J. Fox, White Plains, N.Y., and Joseph H. Burchenal, Noroton, Conn., assignors to Research Corporation, New York, N.Y.

Filed Apr. 16, 1973, Ser. No. 351,704
Int. Cl.[2] C07H *19/06*
U.S. Cl. 536—23 8 Claims

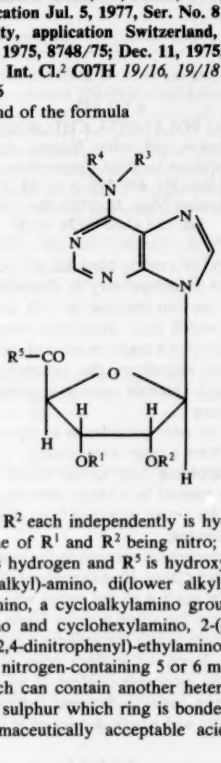
8. 2,2'-anhydro-1-(β-D-arabinofuranosyl)-5-fluorocytosine hydrochloride.

4,104,462
CARDIOACTIVE ADENOSINE NITRATES

Ulf Fischer, Frankendorf, and Günther Haüsler, Reinach, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 654,510, Feb. 2, 1976, abandoned. This application Jul. 5, 1977, Ser. No. 813,200
Claims priority, application Switzerland, Feb. 18, 1975, 2032/75; Jul. 4, 1975, 8748/75; Dec. 11, 1975, 16094/75
Int. Cl.[2] C07H *19/16, 19/18*
U.S. Cl. 536—26 23 Claims

1. A compound of the formula



wherein R^1 and R^2 each independently is hydrogen, or nitro with at least one of R^1 and R^2 being nitro; R^3 and R^4 each independently is hydrogen and R^5 is hydroxy, lower alkoxy, amino, (lower alkyl)-amino, di(lower alkyl)amino, phenyl-(lower alkyl)-amino, a cycloalkylamino group selected from cyclopentylamino and cyclohexylamino, 2-(dimethylamino)-ethylamino, 2(2,4-dinitrophenyl)-ethylamino, 2-(nitro-oxy)-ethylamino or a nitrogen-containing 5 or 6 membered heterocyclic ring which can contain another hetero atom selected from oxygen or sulphur which ring is bonded via a nitrogen atom and pharmaceutically acceptable acid addition salts thereof.

4,104,463
METHOD FOR TREATMENT OF CORN HULLS

Richard Lee Antrim, Clinton, and Donald Wayne Harris, Camanche, both of Iowa, assignors to Standard Brands Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 689,232, May 24, 1976, Pat. No. 4,038,481. This application Jul. 5, 1977, Ser. No. 812,939
The portion of the term of this patent subsequent to Jul. 26, 1994, has been disclaimed.
Int. Cl.[2] C08B *1/00, 37/14*
U.S. Cl. 536—56 3 Claims

1. A method for treating corn hulls wherein said materials are subjected to an alkaline hydrolysis treatment under conditions whereby a non-carbohydrate fraction is solubilized and the resulting residue comprises a holocellulose fraction.

4,104,464
PURIFICATION OF SUCROSE ESTERS

Kenneth James, Reading, England, assignor to Tate & Lyle Limited, London, England

Filed Apr. 16, 1976, Ser. No. 677,702
Claims priority, application United Kingdom, Apr. 18, 1975, 16216/75; Feb. 13, 1976, 5795/76
Int. Cl.[2] C07H *13/06;* C07G *3/00;* C11C *3/10*
U.S. Cl. 536—115 16 Claims

1. A process for the preparation of a soap-free, sucrose ester-containing surfactant, which comprises transesterifying sucrose with at least one fatty acid triglyceride to form a first solid material containing:

(i) fatty acid mono- and di-esters of sucrose;

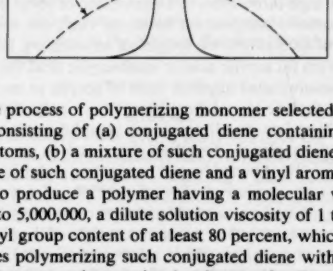
(ii) fatty acid mono-, di- and tri-glycerides; and

(iii) fatty acid soaps, and without an intervening distillation treatment, treating said first solid material with a solution of . metal salt in water or in an alkanol containing 1 to 4 carbon atoms, the salt being a salt of a metal selected from those which form fatty acid salts which are insoluble in said solvent to produce a second solid material containing said insoluble fatty acid metal salts, and separating a product containing sucrose esters by dissolving the esters present in an alkanol with 1 to 4 carbon atoms and evaporating the alkanolic solution to dryness to give a third solid material.

4,104,465
HIGH-VINYL HOMOPOLYMERS AND COPOLYMERS OF BUTADIENE

Adel Farhan Halasa, Bath, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 657,001, Feb. 11, 1976, abandoned. This application Jan. 31, 1977, Ser. No. 764,502
Int. Cl.[2] C08F *4/46*
U.S. Cl. 526—174 6 Claims



1. The process of polymerizing monomer selected from the group consisting of (a) conjugated diene containing 4 to 8 carbon atoms, (b) a mixture of such conjugated dienes, and (c) a mixture of such conjugated diene and a vinyl aromatic compound, to produce a polymer having a molecular weight of 100,000 to 5,000,000, a dilute solution viscosity of 1 to 10, and a 1,2-vinyl group content of at least 80 percent, which process comprises polymerizing such conjugated diene with or without vinyl monomer by reacting 1 to 2 parts of sodium as hydrocarbon sodium with the monomer in the presence of 0.1 to 10 parts by weight of chelating diamine and 0.1 to 2.0 parts of lithium or potassium t-alkoxide per 100 parts of monomer, in which alkoxide the alkane group contains 3 to 20 carbon atoms.

4,104,466

POLYMERIC METAL COMPLEX AND METHOD OF MANUFACTURING THE SAME

Eishun Tsuchida, 1-141, Seki-machi, Nerima-ku, Tokyo, Japan, and Kenji Honda, Tokyo, Japan, assignors to Eishun Tsuchida, Seki, Japan

Filed Mar. 4, 1975, Ser. No. 555,134

Claims priority, application Japan, Mar. 13, 1974, 49-28858; Jun. 14, 1974, 49-67806

Int. Cl.[2] C07D *207/20*

U.S. Cl. 542—433 9 Claims

1. A polymeric composite metal complex which comprises a polymeric metal complex whose central metal is a low valency transition metal selected from the group consisting of metals belonging to Groups VIA, VIIA, VIII, IB and IIB of the fourth to the sixth periods of the periodic table, whose planar ligand is a quadri-dentate monomeric ligand chelate, and whose axial ligand is a polymeric ligand containing a functional group having a coordinating capacity; and one or more addition compounds capable of interaction with said polymeric metal complex, wherein the addition compound is a polyanion which is an acid selected from the group consisting of polycrylic acid, polymethacrylic acid, polyitaconic acid, polyglutamic acid, pectic acid and alginic acid.

4. A method of preparing a polymeric metal complex which comprises (A) reacting a monomeric metal complex whose central metal is a low or high valency transition metal selected from the group consisting of metals belonging to Groups VIA, VIIA, VIII, IB and IIB of the fourth to the sixth periods of the periodic table and whose ligand consists of a quadri-dentate chelate ligand with a polymeric ligand to replace the axial ligand of said monomeric metal complex by said polymeric ligand; or (B) bonding the residual group of a polymeric compound with the central metal of the monomeric metal complex to provide a σ bond between carbon mdetal, and, where the central metal of the monomeric metal complex is a high valency transition metal, reducing said central metal back to a low valency state by carrying out a chemical reaction using a reducing agent or an electrode reaction before, after or simultaneously with the reaction (A) or (B), wherein the residual group of the polymeric compound contains a group selected from the group consisting of a halogenated alkyl group, a hydroxyl group and a carbonyl group.

5. A method according to claim 4, wherein the residual group of the polymeric compound is a copolymer of p-(chloromethyl)styrene or chloroethyl vinyl ether with N-vinylpyrrolidone, acrylamide or acrylic acid.

4,104,467

1,3-BENZODITHIOLANES

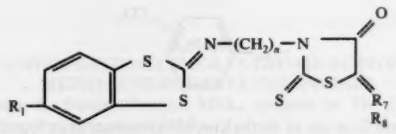
Peter W. Sprague, Titusville, and James E. Heikes, East Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 16, 1976, Ser. No. 705,849

Int. Cl.[2] C07D *277/36*

U.S. Cl. 542—442 23 Claims

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen, halogen, trifluoromethyl, alkyl, alkoxy, nitro, amino or hydroxy; R_7 and R_8 are hydrogen, or together R_7 and R_8 are $=CH-(CH_2)_p-R_9$ wherein p is 0 or an integer of from 1 to 9, and R_9 is hydrogen, carboxy, alkoxycarbonyl, alkyl, phenyl or phenyl mono- or disubstituted with trifluoromethyl, halogen or alkoxy; and n is 0, 1, 2, 3, 4 or 5; wherein the terms "alkyl" and "alkoxy," by themselves or as part of a larger group, refer to groups having 1 to 4 carbon atoms.

4,104,468

1,3,4-OXADIAZOLYL-(2)-VINYL STILBENE OPTICAL BRIGHTENERS

Salvatore Valenti, Bottmingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

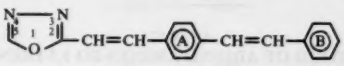
Filed Oct. 26, 1976, Ser. No. 735,797

Claims priority, application Switzerland, Oct. 28, 1975, 13938/75

Int. Cl.[2] C07D *271/10*

U.S. Cl. 542—447 21 Claims

1. A compound useful as an optical brightener and having the formula



wherein the oxadiazole group is unsubstituted or substituted in the 5-position and the rings A and B are unsubstituted or substituted by non-chromophoric substituents.

4,104,469

7-(SYN-α-ALKOXY-IMINOFURYL)ACETAMIDO-3-(2-METHYL-2,3-DIHYDRO-S-TRIAZOLO[4,3-b]PYRIDAZIN-3-ON-6-YLTHIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACIDS

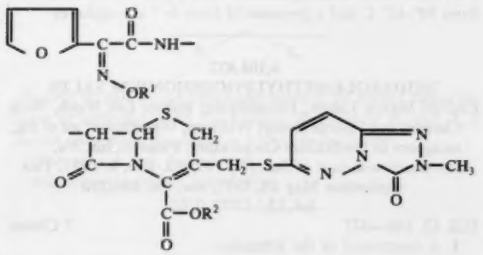
Takayuki Naito, Kawasaki; Jun Okumura, Yokohama, and Seiji Iimura, Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Apr. 15, 1977, Ser. No. 788,056

Int. Cl.[2] C07D *501/36*

U.S. Cl. 544—27 5 Claims

1. A compound having the formula



wherein R^1 is alkyl of 1–4 carbon atoms and R^2 is hydrogen or pivaloyloxymethyl, acetoxymethyl, methoxymethyl, acetonyl, phenacyl, p-nitrobenzyl, β,β,β-trichloroethyl, 3-phthalidyl or 5-indanyl or a nontoxic, pharmaceutically acceptable salt thereof, said compound being at least 75% by weight in the form of its syn isomer.

4,104,470

CRYSTALLIZATION PROCESS FOR CEFAZOLIN SODIUM

Michael D. Cise, Indianapolis, and Harold E. Osborne, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 3, 1977, Ser. No. 803,018

Int. Cl.[2] C07D *501/36*

U.S. Cl. 544—27 7 Claims

1. A process for preparing cefazolin sodium in the monohydrate crystalline form substantially free of other crystalline forms which comprises adding at a temperature between about 10° C. and about 35° C. a solution of substantially pure cefazo-

lin acid in a water-miscible organic solvent selected from the group consisting of dimethylacetamide, dimethylformamide, dimethylsulfoxide, acetonitrile, and isopropanol, said solution having a concentration of cefazolin acid of between about 250 mg./ml. and about 500 mg./ml.; to a solution of a sodium ion donor substance in a water-miscible organic solvent selected from the group consisting of methanol, ethanol, isopropanol, acetone, and methylethyl ketone, wherein said sodium ion donor substance is selected from the group consisting of sodium acetate, sodium propionate, sodium citrate, sodium lactate, sodium 2-ethylhexanoate, sodium hydroxide and sodium carbonate; said sodium ion donor solution containing water in an amount sufficient to constitute between about 3 and about 7 percent by volume of the mixed solutions following addition, and wherein said addition is carried out for between about 2.0 hours and about 2.5 hours.

4,104,471

METHOD OF ADDING AMINES TO 1,3 DIENES

Francis Gordon Albert Stone, Bristol; Michael Green, Chew Stoke; Gary Scholes, and John Lionel Spencer, both of Bristol, all of England, assignors to Air Products & Chemicals, Inc., Allentown, Pa.

Filed Mar. 9, 1977, Ser. No. 775,822
Int. Cl.[2] C07D *295/02, 211/14;* C07C *87/24*
U.S. Cl. 544—178 **1 Claim**

1. In a process for dimerizing a conjugated olefin in the presence of a secondary amine by contacting the conjugated olefin and amine with a palladium catalyst, the improvement for obtaining enhanced yields of dimers while minimizing the formation of trimers and producing 1:2 amine-diene adducts with little to no 1:1 amine diene adducts which comprises: reacting a conjugated olefin selected from the group consisting of butadiene and isoprene with a secondary amine selected from the group consisting of morpholine, piperidine, dimethylamine, and diethylamine in the presence of a complex of bis(cyclo-octa-1,5-diene)palladium and a tertiary phosphine ligand in a 1:1 mole ratio as the palladium catalyst at a temperature of from 50°–60° C and a pressure of from 6–7 atmospheres.

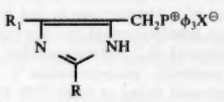
4,104,472

IMIDAZOLEMETHYLPHOSPHONIUM SALTS

Clifford Steven Labaw, Philadelphia; Robert Lee Webb, West Chester, and George Robert Wellman, Warminster, all of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 767,083, Feb. 9, 1977. This application May 24, 1977, Ser. No. 800,150
Int. Cl.[2] C07F *9/65*
U.S. Cl. 548—337 **7 Claims**

1. A compound of the formula:



in which:
R is sulfinic acid, carbolower-alkoxy or carboxy;
R_1 is hydrogen, lower alkyl of 1–6 carbons or phenyl; and
$X^{\ominus}$ is chloride or bromide; or its acid addition salts.

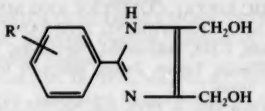
4,104,473

NOVEL IMIDAZOLE COMPOUNDS AND PROCESS FOR PREPARATIONS THEREOF

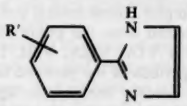
Natsuo Sawa, Nakatado, and Kyoko Gohda, Kanonji, both of Japan, assignors to Shikoku Chemicals Corporation, Japan

Filed Apr. 23, 1976, Ser. No. 679,663
Int. Cl.[2] C07D *233/64*
U.S. Cl. 548—342 **12 Claims**

1. A process for preparing a compound of the formula



wherein R′ represents hydrogen or alkyl of 1 to 4 carbon atoms, which comprises reacting a 2-arylimidazole of the formula



wherein R′ is as defined above, with at least 2 moles, per mole of the 2-arylimidazole, of formaldehyde in a reaction medium having a pH of at least 7.

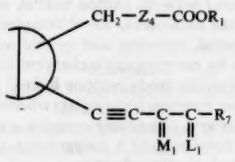
4,104,474

5-OXA-13,14-DIDEHYDRO-11-DEOXY-17-PHENYL-18,19,20-TRINOR-PGF$_{1\alpha}$ COMPOUNDS

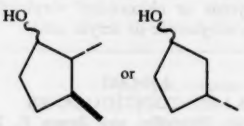
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 657,740, Feb. 13, 1976. This application Aug. 1, 1977, Ser. No. 821,008
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—53 **73 Claims**

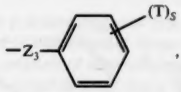
1. A prostaglandin analog of the formula



wherein D is



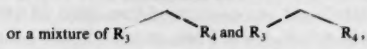
wherein Z_4 is
$-CH_2-O-CH_2-(CH_2)_g-CH_2-$,
$-(CH_2)_2-O-(CH_2)_g-CH_2-$, or
$-(CH_2)_3-O-(CH_2)_g-$; wherein g is one, 2, or 3;
wherein R_7 is



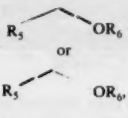
wherein Z_3 is oxa or methylene, s is zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;

wherein L_1 is

-continued



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl, with the further proviso that one or both of R_3 and R_4 is fluoro only when Z_3 is methylene; wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,104,475

DIBENZO[a,d]CYCLOHEPTENES

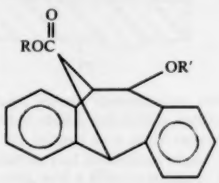
Walton J. Hammar, Saint Paul, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 371,118, Jun. 18, 1973, Pat. No. 3,950,407. This application May 19, 1975, Ser. No. 578,725

Int. Cl.[2] C07C *69/76*

U.S. Cl. 560—56 **2 Claims**

1. A syn or anti compound of the formula



wherein R is lower alkyl and R′ is hydrogen, lower alkyl or lower alkyl acyl.

4,104,476

3,7-INTER-m-PHENYLENE-4,5,6-TRINOR-9-DEOXY-9-METHYLENE-PGF-TYPE COMPOUNDS

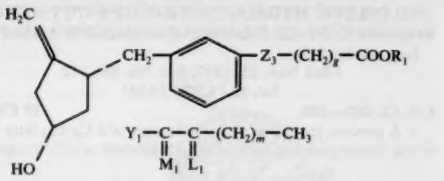
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 682,848, May 4, 1976, Pat. No. 4,060,534, which is a continuation-in-part of Ser. No. 651,622, Jan. 23, 1976, Pat. No. 4,021,467, which is a division of Ser. No. 556,768, Mar. 10, 1975, Pat. No. 3,950,363. This application Sep. 12, 1977, Ser. No. 832,330

Int. Cl.[2] C07C *177/00*

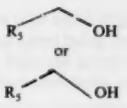
U.S. Cl. 560—61 **61 Claims**

1. A prostaglandin analog of the formula



wherein Z_3 is oxa or methylene;

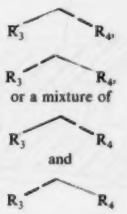
wherein Y_1 is trans—CH=CH—, —C≡C—, or —CH_2C-H_2—; wherein M_1 is



wherein R_5 is hydrogen or methyl;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

wherein L_1 is



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein *g* is one, 2, or 3; and

wherein *m* is one to 5, inclusive.

4,104,477

ESTER DERIVATIVES

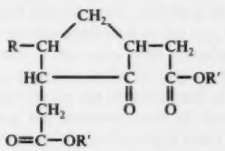
Joe B. Lavigne, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 549,612, Feb. 13, 1975. This application Jan. 11, 1977, Ser. No. 758,388

Int. Cl.[2] C07C *61/38, 69/74*

U.S. Cl. 560—122 **1 Claim**

1. Cyclic keto esters or acids of spirodilactones from alkenyl bis(succinic anhydride) having the formula



in which R is alkenyl of 2 to 28 carbon atoms and R′ groups, which may be the same or different, are hydrogen or alkyl groups of 1 to 8 carbon atoms each.

4,104,478

CATALYTIC HYDROGENATION OF FATTY ACIDS

Bhupendra C. Trivedi, Columbus, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Nov. 23, 1977, Ser. No. 854,441
Int. Cl.[2] C07C *29/00*
U.S. Cl. 568—885 10 Claims

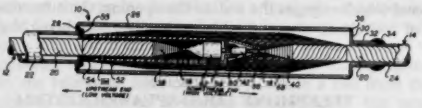
1. A process for the catalytic reduction of a C_4–C_{24} fatty acid to the corresponding carbon length alcohol which comprises hydrogenating the fatty acid at a temperature of from about 170°–250° C. and at a pressure of from about 20–140 atmospheres in the presence of a catalytically effective amount of a co-catalyst system consisting essentially of 1 part by weight of activated rhenium and from 0.25–1.5 parts of an extrinsic metal catalyst selected from the group consisting of ruthenium, rhodium, platinum and palladium.

4,104,479

STOP JOINT FOR LAMINAR DIELECTRIC CABLE

George Bahder, Edison; George S. Eager, Jr., Upper Montclair; Attila F. Dima, Piscataway, and James J. Walker, Berkeley Heights, all of N.J., assignors to General Cable Corporation, Greenwich, Conn.

Filed Dec. 28, 1976, Ser. No. 755,029
Int. Cl.[2] H02G *15/24*
U.S. Cl. 174—22 R **12 Claims**



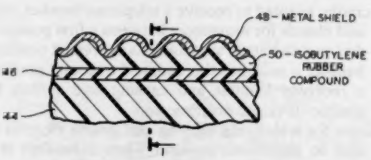
11. A stop joint located between ends of different lengths of cable that are connected together including in combination a stop tube connected fluid-tight at its upstream end with a shield that surrounds a cable for confining a fluid around the cable core, an inner electrode surrounding a bare end of a conductor of the cable that passes through the stop tube, the electrode being adjacent to the downstream end of the stop tube, and a connector at the downstream end of the stop tube and into which the conductor of the cable is secured, the connector sealing the downstream end of the stop tube to prevent escape of fluid therefrom, and an inner barrier in the connector to stop fluid flow through the connector.

4,104,480

SEMICONDUCTIVE FILLING COMPOUND FOR POWER CABLE WITH IMPROVED PROPERTIES

Paul F. Thompson, Millington, N.J., assignor to General Cable Corporation, Greenwich, Conn.

Filed Nov. 5, 1976, Ser. No. 739,315
Int. Cl.[2] H01B *7/28*
U.S. Cl. 174—23 C **13 Claims**



1. A high-voltage, power transmission cable including a conductor, conductor shield, insulation, insulation shield and outer shield, that are subject to a wide range of temperature variations during the service conditions under which the cable is intended to be used, and a filler compound between one of the shields and a confronting face of another part of the cable to prevent migration of water longitudinally along the interface of said shield and said other part, the filler material being amorphous polypropylene adhered to both the shield and said other part at all temperatures within said range.

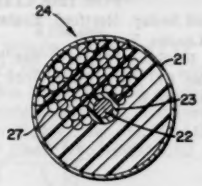
4,104,481

COAXIAL CABLE WITH IMPROVED PROPERTIES AND PROCESS OF MAKING SAME

Frederic Nash Wilkenloh, Conover; Paul Alan Wilson, Hickory, and Steve Allen Fox, Taylorsville, all of N.C., assignors to Comm/Scope Company

Continuation of Ser. No. 584,164, Jun. 5, 1977, abandoned. This application Jun. 8, 1977, Ser. No. 804,520
Int. Cl.[2] H01B *3/30;* H01P *3/06;* H01B *11/18*
U.S. Cl. 174—28 **25 Claims**

1. An electrical cable having at least one inner conductor, an outer tubular conductor circumferentially surrounding the inner conductor and a gas expanded polyolefin dielectric formed by a composite of polyolefin, entrapped gas, and particles of a nucleating agent disposed between the inner and outer conductors to electrically insulate the inner and outer conductors from each other, the improvement comprising said composite of polyolefin, and entrapped gas and nucleating agent



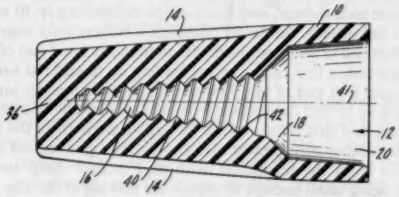
having a density between 0.20 and 0.10 grams per cubic centimeter and said nucleating agent being composed of undecomposed particles selected from the group consisting essentially of azobisformanies, calcium carbonate, silica, and silicates.

4,104,482

SCREW-ON CONNECTOR

William J. Scott, Sycamore, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.

Continuation of Ser. No. 617,820, Sep. 29, 1975, abandoned. This application Dec. 27, 1976, Ser. No. 754,180
Int. Cl.[2] H01R *5/12*
U.S. Cl. 174—87 **26 Claims**



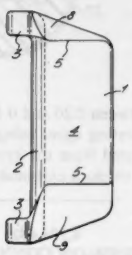
14. An insulated cap for covering and connecting by compression the stripped ends of a plurality of insulated electrical conductor wires or the like, including a shell of insulating material with an interior open at one end to receive the stripped ends of the wires and closed at the other end by an end wall, and a wire-engaging, nonexpanding thread formation in the interior for engaging the stripped ends of the wires, the thread formation being larger at the open end of the shell and smaller toward the end wall, the small end of the thread formation being at a lesser included angle than the included angle at the large end while presenting an intermediate included angle different from the other two included angles.

26. A method of joining the stripped ends of a plurality of insulated electric wires, including the steps of providing an insulating cap having a generally open threaded central bore in the general shape of a concave frustum of a cone with at least two threaded thread-forming portions therein that have different included angles, grouping together the stripped ends of a plurality of insulated electric wires, inserting the thus grouped stripped ends into the threaded bore of the cap, initially engaging the stripped ends of the wires with threaded thread-forming portion having a greater included angle while turning the cap down progressively on the stripeed ends of the wires, and thereafter engaging the stripped ends of the wires with a threaded thread-forming portion having a lesser included angle than the initially engaged portion while continuing to turn the cap down progressively on the stripped ends of the wires so the stripped ends of the wires are captured in both included angles.

4,104,483
DEVICE SUITABLE FOR USE IN A RAILWAY RAIL-AND-FASTENING ASSEMBLY TO INSULATE A RAIL FROM A RAIL CLIP AND FROM AN ANCHORAGE FOR THE CLIP

David Ronald Seeley, Hertford, England, assignor to Pandrol Limited, London, England

Filed Nov. 26, 1976, Ser. No. 745,424
Int. Cl.[2] E01B *26/00, 9/44;* H01B *17/00*
U.S. Cl. 174—138 R 9 Claims

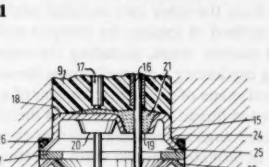


2. A device suitable for use in a railway rail-and-fastening assembly to insulate a rail from a rail clip and from an anchorage for the clip, comprising a first portion which is elongate and plate-like, said first portion having first and second ends, a second portion depending from one side of the first portion, and two lugs projecting from the second portion in the same direction as one another away from the first portion and near opposite ends thereof, said first portion comprising on its upper face a flat surface, the center of which is substantially nearer to said first end of said first portion than to said second end of said first portion, a first ramp surface leading up to said flat surface from said first end of said first portion, a second ramp surface leading up to said flat surface from said second end of said first portion, said first ramp surface having an angle from the horizontal substantially greater than the angle of said second ramp surface from the horizontal with said second ramp surface angle being small enough to permit the driving of the clip onto said flat surface without shearing off the second lug.

4,104,484
CONDUCTOR LEAD-THROUGH

Hendrik Jan Ijlstra, Egmond a/d Hoef, and Gerardus Joachim Maria van den Boogaard, Utrecht, both of Netherlands, assignors to Ultra Centrifuge Nederland N.V., The Hague, Netherlands

Filed May 13, 1976, Ser. No. 687,299
Claims priority, application Netherlands, Jun. 23, 1975, 7507440
Int. Cl.[2] H01B *17/30;* H02K *5/22*
U.S. Cl. 174—151 2 Claims

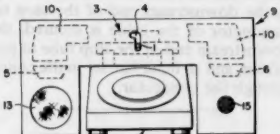


1. A conductor lead-through for elongated bodies, comprising at least one electric current conductor, which conductor lead-through contains no welded joints and is particularly suitable for use with difficultly weldable or non-weldable combinations of materials, said conductor lead-through comprising an assembly of parts including a cover through which said current conductor passes in insulating relationship with respect thereto, said cover having an outwardly sloping flanged edge, an intermediate ring engaging the flanged edge of the cover, and an O-ring seal fitted about said cover and engaging the outer surface of the flanged edge of the cover and being held in compression between said outer surface and a shoulder on the wall of an opening into which said assembly is fitted, said parts of said assembly being retained together and secured in the opening by means of a clamp ring, said clamp ring having a flexible part which extends around its periphery and which engages the wall of the opening, the outer diameters of said clamp ring and said intermediate ring being the same.

4,104,485
TELEPHONE LOUD-SPEAKER SYSTEM

David Péssel, 14 Courtenay Cir., Pittsford, N.Y. 14534, and Neil C. Wilhelm, 3631 Gleason Ave., San Jose, Calif. 95130

Filed Mar. 15, 1976, Ser. No. 667,129
Int. Cl.[2] H04M *1/00*
U.S. Cl. 179—1 HF 4 Claims



1. Apparatus for use with a telephone of the type having a handset receivable on at least one spring-raised switch button when not in use to depress the switch button for controlling electrical operation of the telephone, said apparatus comprising:

a chassis;

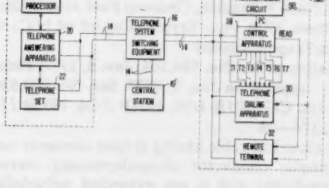
a cradle, adapted to receive a telephone handset, mounted in said chassis for movement between a first position causing said switch button to assume its depressed position when a handset is received thereon, and a second position raising a received handset and causing said switch button to assume its raised position; and

means for selectively moving said cradle from its first position to its second position when a handset is received thereon.

4,104,486
SYSTEM FOR ACCUMULATING DATA OVER NONDEDICATED TELEPHONE LINES

John R. Martin, 3129 W. Mill Rd., Milwaukee, Wis. 53209, and Robert S. Block, 777 W. Glencoe Pl., Milwaukee, Wis. 53217

Filed Jun. 29, 1976, Ser. No. 701,033
Int. Cl.[2] H04Q *9/00;* H04M *11/00*
U.S. Cl. 179—2 AM 6 Claims



1. A telephone data accumulator system comprising:

at least one selectively operable telephone data transmitting

device at a remote location, said device including a data accumulator that accumulates data pertaining to services used at the remote location and means for generating a predetermined telephone dialing signal, both connected across non-dedicated telephone lines in parallel therewith so as not to interfere with normal service to a telephone connected across said lines;

line capture means connected across the telephone lines in parallel therewith at the remote location for seizing the telephone lines in preparation for placing a call;

means at the remote location for selectively conditioning said line capture means and generating means respectively on a time-selected basis to seize the telephone lines and to generate said dialing signals and apply said dialing signals to the telephone lines to thereby initiate a call from the remote location to a central location over the non-dedicated telephone lines;

a data utilization device at the central location;

means at the central location for automatically answering the call initiated from the remote location and producing a connection between the remote location and the central location over the telephone lines;

means at the remote location connected to the telephone lines for detecting a go-ahead signal on the telephone lines; and,

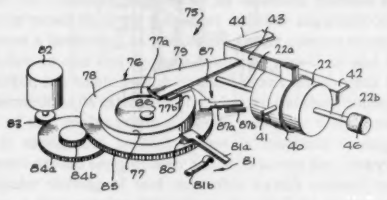
means responsive to said detected go-ahead signal for transferring data from the data accumulator at the remote location to the utilization device at the central location over the telephone lines connecting said remote location and said central location.

4,104,487

TELEPHONE ANSWERING DEVICE WITH REMOTE CONTROLLED PLAYBACK

Sava Jacobson, 8130 Orion St., Van Nuys, Calif. 91406

Filed Dec. 13, 1976, Ser. No. 749,676
Int. Cl.[2] H04M *1/64*
U.S. Cl. 179—6 E **7 Claims**



7. A telephone answering device of the type including means for automatically playing back incoming messages that have been previously recorded on tape, and having a reel drive motor that is mechanically positionable alternately to forward and reverse tape drive positions by an assembly comprising:

a motor positioning cam,

a cam follower cooperating with said cam and connected to position said drive motor in accordance with the orientation of said cam,

a cam drive motor for driving said cam between first and second orientations in which the cam follower positions said reel drive motor respectively in said forward and reverse positions.

first circuit means for energizing said cam drive motor in response to occurrence of an automatic playback control signal and for maintaining said cam drive motor energized only long enough to rotate said cam from said first orientation to said second orientation so as to position said reel drive motor in said reverse position, and

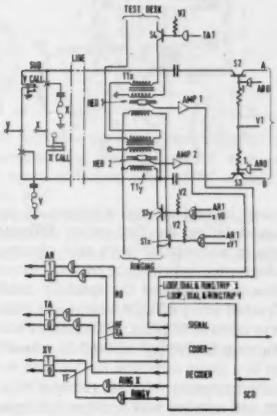
second circuit means, including an end of rewind switch actuated when all of said tape has been rewound, for energizing said cam drive motor upon actuation of said end of rewind switch and for maintaining said cam drive motor energized only long enough to rotate said cam from said second orientation back to said first orientation so as to position said reel drive motor in said forward position.

4,104,488

SUBSCRIBER LINE CIRCUIT

Donald A. Weir, Goff's Oak, Nr. Cheshunt, and Anthony W. Sweet, Saffron Walden, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 19, 1977, Ser. No. 798,415
Int. Cl.[2] H04B *3/46*; H04M *3/02*
U.S. Cl. 179—18 FA **9 Claims**



7. In an automatic telephone exchange serving two subscribers connected in a party line manner a line circuit comprising:

direct current supply means having one terminal thereof connected to one wire of the line via a winding on a first transformer and the other terminal of the direct current supply connected to the other wire of the line via a winding on a second transformer;

an additional winding on each of said transformers via which an alternating current may be coupled when required to its one of the line wires;

two Hall effect devices each of which being associated with one only of the line wires for detecting when direct current flows in its one of the line wires with which it is associated; and

magnetic circuit means for each Hall effect device of each of said line wires coupled to said transformer windings and including said transformer windings for each of said line wires.

4,104,489

HOLOGRAPHIC MEMORY WITH FRINGE STABILIZING COMPENSATION FOR RECORDING MEDIUM MOTION

Isao Satoh, and Makoto Kato, both of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Feb. 15, 1977, Ser. No. 768,744
Claims priority, application Japan, Feb. 18, 1976, 51-17294
Int. Cl.[2] G03H *1/30*; G11B *7/00*
U.S. Cl. 179—100.3 G **18 Claims**

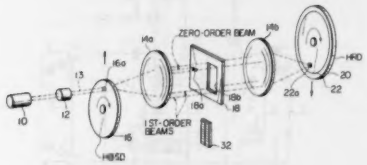
1. A holographic recording system for recording the hologram of an electrical signal, comprising:

an array of identical random phase illumination holograms arranged in sequence to successively receive substantially monochromatic light for diffracting the light incident thereon into a zero-order diffracted beam of light and into

a first-order diffracted array of sampled, phase-shifted beams of light;

a double diffraction lens system comprising a first Fourier transforming lens receptive of the zero-order beam and the first order diffracted array of light beams for focusing the light beams in the focal plane and a second Fourier transforming lens aligned to receive the light beams focussed by said first Fourier transforming lens;

a mask having a first and a second aperture and disposed in the focal plane of said first and second Fourier transforming lenses for allowing the transmittance of only the zero-order diffracted beam and the first-order diffracted array of light beams through the first and second apertures, respectively, and beyond the focal plane;



means disposed in said second aperture of said mask for spatially modulating the first-order diffracted array of light beams in accordance with said electrical signal to form a holographic interference pattern between the zero-order diffracted beam and the spatially modulated first-order diffracted array of light beams in a plane conjugate to said array of random phase illumination holograms; and

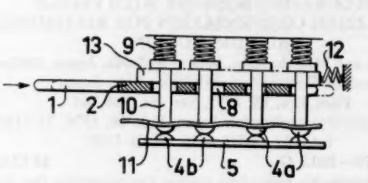
means for moving said array of random phase illumination holograms in a given direction so that said holograms are successively receptive of said substantially monochromatic light and moving said hologram forming plane in a direction opposite to said given direction at equal speed to the speed of movement of said random phase illumination holograms so that a series of holographic interference patterns is formed on said hologram forming plane.

4,104,490

CODING LOCK

Göran Lundström, Enskede, and Karl Nolte, Huddinge, both of Sweden, assignors to Hugin Kassaregister AB, Stockholm, Sweden

Filed Jun. 21, 1976, Ser. No. 697,990
Claims priority, application Sweden, Jun. 19, 1975, 7507082
Int. Cl.[2] H01H 3/16
U.S. Cl. 200—44 **9 Claims**



1. A lock system comprising:

a key having an edge portion along which there are formed a plurality of lugs and gaps in a predetermined pattern;

a key receiving means having an elongated passage for insertion of the key and longitudinal movement of the key along the passage;

a plurality of electrical contact members arrayed in first and second rows longitudinally along said passage, with the respective contact members of said first and second rows being opposite each other, and said contact members of said first row being fixedly mounted and said contact members of said second row being selectively movable toward and away from the contact members of said first row under control of the key;

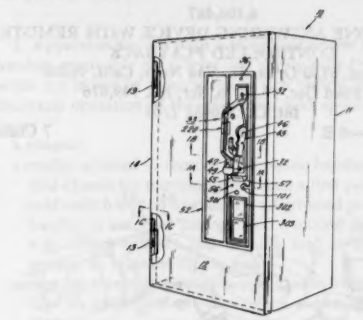
a resilient return means adjacent said key passage for engagement by said key as it is moved longitudinally through said key passage, said key being movable to a rest position in said key passage where it is unbiased by said resilient means and said contact members of said second row are not moved, said key, when moved to a second position in said key passage engaging said return means and controlling corresponding contact members of said second row in accordance with the pattern of lugs and gaps on said key, to move said corresponding second row contact members toward and into electrical contact with said contact members of the first row.

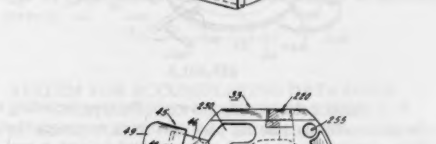
4,104,491

LATCH MEANS FOR SWITCH ENCLOSURE

Gerald R. Duble, New Windsor, Md., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 9, 1976, Ser. No. 748,731
Int. Cl.[2] H01H 9/20
U.S. Cl. 200—50 A **5 Claims**





1. Enclosed electric switch apparatus including an enclosure having a front opening, a cover hingedly connected along one of its edges to said enclosure for closing said opening, switch means inside said enclosure including a contact operating mechanism, switch operating means mounted to said enclosure forward of said contact operating mechanism, said operating means including platform means comprising a housing, manual operating handle keyed to pivot means mounted to said housing, linkage means keyed to said pivot means and connected to said operating mechanism for operation of the latter by operation of said handle, said cover including aperture means through which said housing extends when said cover is closed, said aperture means disposed adjacent an edge of said cover

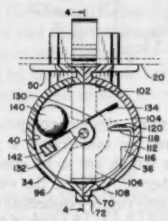
opposite said one edge thereof, cover catch means on said platform means biased toward a holding position for maintaining the cover closed, defeatable cover interlock means on said platform means to normally prevent operation of said catch means to release said cover when said handle is in switch closed position, and defeatable switch interlock means on said platform means to normally prevent operation of said handle to switch closed position when said cover is open, holding means biased toward an active position and operated to an inactive position by said cover upon closing thereof, said holding means when in said active position maintaining said catch means in cover releasing position.

4,104,492

GRAVITY ACTUATED LIGHT SOCKET AND SWITCH MEANS

Frank V. Pliml, Jr., Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Sep. 23, 1977, Ser. No. 836,182
Int. Cl.[2] H01R *33/28*
U.S. Cl. 200—51.14 **11 Claims**



1. A gravity actuated light socket and switch means including a dielectric light socket having a horizontal axis, means adapted for retaining said socket in mounted relation to an apertured panel fixed on a support member angularly moveable about a horizontal axis, multiple socket contact means for connection to and conveying a source of power to and from said socket, moveable switch contact means teeter-totter fashion intermediate its extremities on a horizontal shaft connected to one of said socket contact means, moveable weight means shiftable along said contact means in response to angular movement of said support member, stop means for controlling the angular shifting of said moveable switch contact means between a first angular disposition of said light socket and a second angular disposition, the second one of said stop means being a fixed contact connected to a power source and adapted to be touched by said moveable switch contact means when said light socket is placed in said second disposition by shifting of said moveable weight means, whereby power is supplied to said socket contacts.

4,104,493

SWITCH FOR DETECTING COLLISION OF VEHICLE

Yoshihiro Hibino; Hideaki Sasaya, both of Okazaki, and Akihiro Kobayashi, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 4, 1976, Ser. No. 738,756
Claims priority, application Japan, Dec. 15, 1975, 50-169631[U]
Int. Cl.[2] H01H *35/14*
U.S. Cl. 200—61.45 R **4 Claims**

1. A collision detecting apparatus for motor vehicle comprising:

a casing made of non-conductive material;

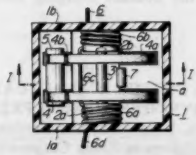
a shaft disposed in said casing:

supporting means, fixed to said casing, for rotatably supporting said shaft;

a pair of plate members, each being fixed to said shaft and spaced at a predetermined distance from each other;

massive weight means fixed to said pair of plate members at a position apart from said shaft for rotating said pair of plate members;

a conductive stationary contact fixed to said casing and extending through the space defined between said pair of plate members;



conductive movable contact means coupled to said pair of plate members for making contact with said stationary contact upon sufficient rotation of of said pair of plate members; and

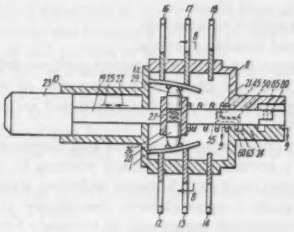
biasing means secured to said housing and to said pair of plate members, for biasing said movable contact means to a position apart from said stationary contact.

4,104,494

ELECTRIC SWITCHES

David Allen Swann, 17-21 Carinish Rd., Clayton, Victoria, 3168, Australia

Continuation of Ser. No. 634,176, Nov. 21, 1975, abandoned.
This application Dec. 20, 1976, Ser. No. 752,283
Claims priority, application Australia, Nov. 25, 1974, 9740/74; Dec. 3, 1974, 9857/74
Int. Cl.[2] H01H *9/00*
U.S. Cl. 200—67 G **10 Claims**



1. An electric switch having a linearly reciprocably moveable actuator; a first electric contact which acts, in use, as a fulcrum, a second electric contact and a first contact bridging member on one side of the path traversed by the actuator in linearly reciprocably moving; a third electric contact which acts, in use, as a fulcrum, a fourth electric contact and a second contact bridging member on an opposite side of said path; an aperture extending through the actuator transverse to said path, the actuator including biasing means extending through the aperture, urging the first and second contact bridging members outwardly of said path into engagement with the respective fulcrum and operative in use to transmit linear reciprocating movement of the actuator into sliding movement of the contact bridging members over the respective fulcrum and to bias the contact bridging members to pivot about the respective fulcrum to bring the leading or trailing end of the contact bridging members into or out of contact with the respective one of the second and fourth contacts;

the biasing means including a coil spring extending in said aperture and having each of its ends received within a respective one of two blind sleeves which are in part

received in and guided by the aperture and which transmit the bias of the spring to the contact bridging members;

each contact bridging member having means defining a pair of longitudinally spaced, opposed abutments thereon which are effective on that side of the respective contact members which is remote from the respective contacts for engagement by the respective blind sleeves externally of said blind sleeves for translating reciprocating movement of said actuator into rocking, sliding movement of said contact bridging members in the absence of mechanical pinning of the contact bridging members to the blind sleeves.

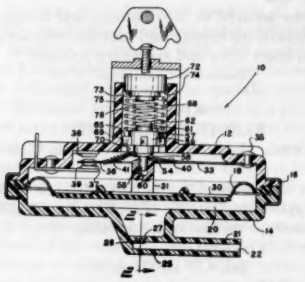
4,104,495
PRESSURE SWITCH AND ACTUATING MEANS RESPONSIVE TO LOW PRESSURE

William H. Jones, Villa Park, and Gordon L. Astrom, Byron, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 405,225, Oct. 10, 1973, abandoned. This application Apr. 8, 1974, Ser. No. 458,948

Int. Cl.² H01H *35/34*

U.S. Cl. 200—83 P **4 Claims**



1. A pressure switch comprising:

first and second housing portions;

diaphragm means between said housing portions defining an expansible pressure chamber on one side of said diaphragm means at least partially within said second housing portion;

switch means on the opposite side of said diaphragm movable from a normal to an actuated position by said diaphragm means, said switch means including a snap blade having a guide tongue element operatively associated with said diaphragm means and an actuating tongue element carrying a contact movable between said positions;

said first housing portion having a bore aligned with said guide tongue and an annular base within said bore adjacent said guide tongue, said annular base defining a central opening extending therethrough and at least two configured slots extending outwardly from said opening and extending through said bore;

adjustable spring means within said bore for biasing said guide tongue and said blade to said normal position, said spring means including an actuator having a body portion disposed within said opening in said base and at least two ears extending from said body generally conforming to the shape of said slots and received therein, said actuator at least partially disposed within said base and contacting said guide tongue element;

said guide tongue has an elongated slot therethrough;

said diaphragm means includes a resilient diaphragm, a relatively rigid plate secured to said diaphragm and an actuating post extending from said diaphragm plate, said actuating post having a generally spherical end abutting said guide tongue element and an opening extending within said actuating post from said spherical end, said opening generally aligned with said slot in said guide tongue; and

said actuator has a spherical portion depending from the body thereof and contacting said guide tongue and a guide stem portion depending from said spherical portion and received within said opening in said actuating post.

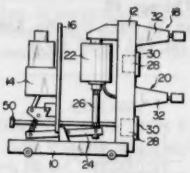
4,104,496
VACUUM INTERRUPTER DEVICE

Hiroshi Koike, Tama; Hideaki Wakayama, Fuchu; Hiroshi Ohashi, Tokyo, and Kunio Yokokura, Fuchu, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 18, 1977, Ser. No. 760,424

Int. Cl.² H01H *33/66*

U.S. Cl. 200—144 B **6 Claims**



1. A vacuum interrupter device comprising a frame; an insulating barrier erected on said frame; a pair of terminals attached to said barrier which are to be connected to a main electric circuit; a chamber provided at the vicinity of said pair of terminals; a vacuum interrupter connected between said pair of terminals; an operating means to operate the vacuum interrupter; a non-linear resistor placed in said chamber connected between either one of the pair of terminals and the ground to lead make-and-break surges caused by said vacuum interrupter to the ground.

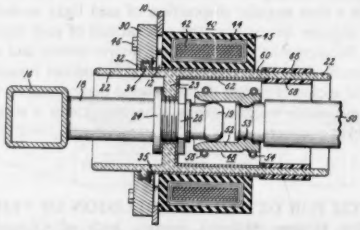
4,104,497
DISCONNECT CONTACT ASSEMBLY FOR METAL-CLAD SWITCHGEAR AND THE LIKE

Robert Harwood Brealey, Exton, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Aug. 30, 1976, Ser. No. 719,044

Int. Cl.² H01H *9/02*

U.S. Cl. 200—305 **4 Claims**



1. A disconnect contact assembly for metal clad switchgear and the like, comprising:

a. a metal plate at ground potential having an opening therein,

b. a first conductive stud extending forwardly through said opening in radially-spaced relationship to the periphery of said opening and terminating in a free end,

c. a tubular insulator surrounding and fixed to said first stud and also extending through said opening, said tubular insulator having a forward tubular portion that surrounds and is radially spaced from said free end of said first stud,

d. a second conductive stud generally aligned with said first stud and having an end portion surrounded in radially-spaced relationship by said forward portion of said tubular insulator,

e. a bridging contact subassembly bridging the ends of said studs and conductively interconnecting said ends, said bridging contact subassembly being located in a position surrounded by said forward portion of said tubular insulator and radially spaced from said forward portion of said tubular insulator,

f. an annular current transformer secondary assembly surrounding said portion of said tubular insulator,

g. a first metallic coating normally at ground potential surrounding said portion of said tubular insulator and said secondary assembly, and coating the outer periphery of said portion of said tubular insulator,

h. a second metallic coating normally at the potential of said first stud coating the inner periphery of said forward portion of said tubular insulator and surrounding said bridging contact subassembly in radially-spaced relationship thereto,

i. a first semiconductor coating having non-linear resistivity properties on the external surface of said tubular insulator at the forward end of said first metallic coating, and

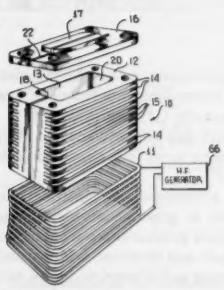
j. a second semiconductor coating having non-linear resistivity properties on the internal surface of said tubular insulator at the forward end of said second metallic coating.

4,104,498

APPARATUS FOR AND METHOD OF INDUCTION HEATING OF METAL PLATES WITH HOLES

Howard L. Gerber, Park Forest, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Jun. 28, 1976, Ser. No. 700,494
Int. Cl.[2] H05B *5/18*
U.S. Cl. 219—10.43 **16 Claims**



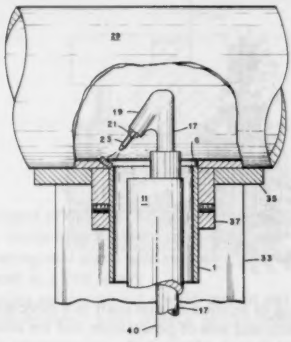
1. A flux concentrator for induction heating of preselected areas of metal plates, said flux concentrator comprising a transformer; said transformer comprising a single winding secondary coil form in the form of a thick wall tubular body of a selected height, said body having remote end faces, said body being interrupted by an axial slot extending from the exterior of said body to the interior thereof for the full height of said body, and a multiple winding primary coil wrapped around the exterior of said secondary coil form with the windings of said primary coil bridging said slot; and a nosepiece overlying one of said coil form end faces in electrical conducting relation, said nosepiece being in the form of a generally axially coextensive cover plate for said coil form and having a longitudinal slot therein for the full height thereof, said nosepiece slot being in alignment with said coil form slot with a portion of said nosepiece slot forming an axial extension of said coil form slot.

4,104,499

ELECTRIC ARC WELDING GUN

Edward Luttrell, Clinton, Tenn., and Paul W. Turner, Idaho Falls, Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 2, 1976, Ser. No. 737,757
Int. Cl.[2] B23K *9/02*
U.S. Cl. 219—60 A **5 Claims**



1. Apparatus for interiorly welding the joint formed by a first tubular member teed into a second tubular member comprising:

an arc welding gun including an elongated and electrically conductive barrel positioned to extend longitudinally through the first member, in laterally offset relation to the axis thereof, and into the interior of the second member, the portion of said barrel extending into the second member being provided with an electrically conductive and reversely extending tubular tip which extends adjacent to said portion, said gun also including a welding electrode which is supported by and extends from said tip, the axes of said tip and electrode defining an acute angle with the axis of said portion of said barrel;

electrically non-conductive gun-support means extending coaxially within said first member and rotatable about the axis of the first member, said means being clamped to a section of said barrel;

drive means coupled to said support means for rotating the same; and

an electrical power supply connected between said barrel and said joint.

4,104,500

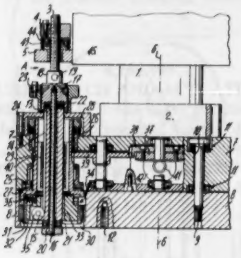
DEVICE FOR ELECTRICAL DISCHARGE MACHINING WITH SIMULTANEOUS RELATIVE ADVANCE AND CYCLE TRANSLATIONAL MOVEMENT OF THE ELECTRODES

Georges Wyss, Niederrohrdorf, Switzerland, assignor to Ateliers des Charmilles S.A., Geneva, Switzerland

Filed Jun. 16, 1976, Ser. No. 696,712
Claims priority, application Switzerland, Jun. 18, 1975, 7932/75; Sep. 8, 1975, 11598/75
Int. Cl.[2] B23P *1/08*
U.S. Cl. 219—69 V **10 Claims**

1. In an electrical discharge machining arrangement for machining the surface of a recess in a workpiece electrode, in which relative movements of the electrodes are controlled to maintain given sparking conditions in a machining zone comprised between the electrodes, and comprising a device for controlling a translational displacement of one electrode relative to the other both in the direction of an axis of penetration of one of said electrodes into the other electrode and in a plane perpendicular to said axis, said device comprising a support for

said one electrode, first means for moving the support in translation along said axis, and second means for moving the support in translation according to a predetermined amplitude in a plane perpendicular to said axis to provide a combined translational movement of the support along said axis and in said perpendicular plane, said second means comprising an eccentric member having, parallel to said axis of penetration, an axis in relation to which said support is fixed, the improvement comprising a rotatable shaft having an axis parallel to said axis of penetration, said eccentric member cooperating with said



shaft for sliding in relation to said shaft in a direction forming a 45° angle with said axis of penetration and for rotating with said shaft about the axis of said shaft, and means for sliding said eccentric member relative to said shaft in response to movement of the support along said axis by said first means such that the amplitude of said translation of said support in said plane progressively increases as a function of the translational movement along said axis when advancing said support beyond a predetermined distance and decreases as a function of the translational movement along said axis when withdrawing said support to said predetermined distance.

4,104,501

METHOD OF ELECTRICAL DISCHARGE MACHINE WITH SIMULTANEOUS RELATIVE ADVANCE AND CYCLIC TRANSLATIONAL MOVEMENT OF THE ELECTRODES

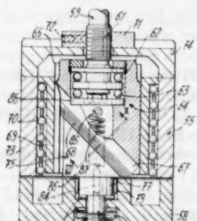
Georges Wyss, Niederrohrdorf, Switzerland, assignor to Ateliers des Charmilles S.A., Geneva, Switzerland

Filed Jun. 16, 1976, Ser. No. 696,713

Claims priority, application Switzerland, Jun. 18, 1975, 7932/75

Int. Cl.[2] B23K *9/16*

U.S. Cl. 219—69 M **5 Claims**



1. In a method of machining by electrical discharges the surfaces of a recess in a workpiece electrode to substantially the same shape as a tool electrode, said method comprising controlling the relative displacements of the electrodes which are translationally movable relative to one another both in the direction of an axis of penetration of one electrode into the other and in a plane perpendicular to said axis and displacing one of the electrodes along said axis of penetration to produce sparking in a machining zone comprised between corresponding surfaces of said electrodes, said machining zone extending on frontal and lateral portions of said surfaces, the improvement comprising simultaneously relatively moving the electrodes in translation in said perpendicular plane with a predetermined amplitude, and progressively increasing said amplitude as a function of the penetration along said axis to provide a combined oblique relative translational movement along at least one generatrix of a surface of revolution of increasing section in said direction of penetration, while controlling said oblique relative translational movement to maintain given sparking conditions in the machining zone comprised between said electrodes at said frontal and lateral portions of said surfaces, wherein the amplitude of said relative translational movement in said plane increases linearly with the penetration along said axis whereby said oblique relative translational movement is along a generatrix of a cone coaxial to said axis of penetration and said generatrix is substantially at 45° to said axis of penetration.

4,104,502

ELECTRO-EROSION MACHINE TOOL WITH COMPENSATION FOR OPERATING FORCES, AND METHOD OF OPERATION

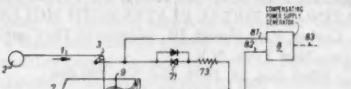
Werner Ullmann, Locarno, Switzerland, and Rudolf Panschow, Hanover, Germany, assignors to A.G. für industrielle Elektronik AGIE, Locarno, Switzerland

Continuation-in-part of Ser. No. 588,620, Jun. 19, 1975, abandoned. This application Jul. 26, 1976, Ser. No. 708,299

Claims priority, application Switzerland, Nov. 25, 1974, 15639/74

Int. Cl.[2] B23K *9/16*

U.S. Cl. 219—69 W **14 Claims**



1. In an electro-erosion machining method, which includes the steps of controlling movement of a wire, ribbon or strip-like tool electrode (1) with respect to a workpiece (7) while leaving a spark gap (9) between the electrode and the workpiece, and while supplying electrical power to the spark gap, the step of

supplying a compensating electrical current to the tool electrode (1) to generate an electromagnetic compensating field which generates forces acting on the electrode of a magnitude and direction which compensate uncontrolled disturbance and distortion forces acting on the tool electrode during operation.

4,104,503

METHOD OF ELECTROEROSION AND AN APPARATUS FOR PRODUCING CAVITIES INSIDE A SOLID METAL COMPONENT

Learco Di Piazza, Ispra (Varese), and Angelo Migoni, Castelletto Ticino, both of Italy, assignors to European Atomic Energy Community (Euratom), Kirchberg, Luxembourg

Filed Sep. 29, 1976, Ser. No. 727,631

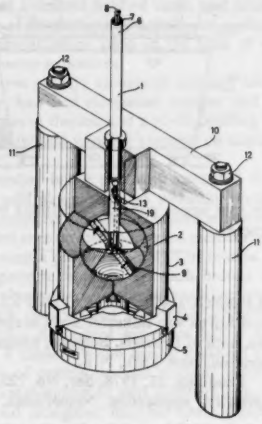
Claims priority, application Luxembourg, Oct. 2, 1975, 73498

Int. Cl.[2] B23P *1/04, 1/16*; B23K *9/16*

U.S. Cl. 219—69 E **7 Claims**

1. An apparatus for creating cavities by electroerosion within a solid component, comprising a hollow stationary cylinder; a single electrically conductive driving control rod surrounded by and coaxial with said cylinder; a driving square terminating one end of said rod; and an electrode connected to

said driving square, said electrode by the driving control rod being pivotable around an axis perpendicular to the axis of the



cylinder, movable together with the rod along the axis of the cylinder, positionable perpendicular to the axis of said cylinder and rotatable around said axis of said cylinder.

4,104,504

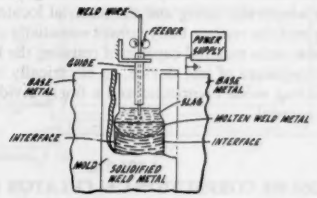
WELDING MANGANESE STEEL

Charles E. Ridenour, Chicago Heights; Herman A. Fabert, Jr., Homewood, both of Ill.; John Tasker, West Milford, and Hugo R. Larson, Ridgewood, both of N.J., assignors to Abex Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 613,040, Sep. 12, 1975, abandoned. This application May 23, 1977, Ser. No. 799,567

Int. Cl.[2] B23K *9/18*

U.S. Cl. 219—73.1 **42 Claims**



1. A method for joining sections of austenitic manganese steel by welding comprising:

A. separating the sections to afford a gap therebetween;

B. disposing in the gap a coaxially related weld wire and guide for the weld wire;

C. consumming the weld wire and guide by the electroslag process progressively to deposit weld metal to join the sections, the sides of the base metal facing the gap melting to contribute manganese steel to the weld;

D. the guide and weld wire being constituted to contribute austenite stabilizers selected from the group consisting of manganese, nickel and copper, together with at least about 0.55% carbon in the weld wire, in amounts adequate to maintain substantially the austenitic integrity of the weld metal; and

E. maintaining a gap width and weld wire feed rate such that the weld metal deposits at a rate sufficiently rapid to avoid embrittlement in the heat affected zone.

4,104,505

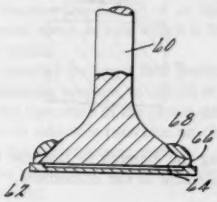
METHOD OF HARD SURFACING BY PLASMA TORCH

Larry W. Rayment, Battle Creek, and Thomas S. Kilbourn, Richland, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 28, 1976, Ser. No. 736,296

Int. Cl.[2] B23K *9/04*

U.S. Cl. 219—76.16 **8 Claims**



1. A method of hard surfacing a workpiece using a plasma arc torch, comprising the steps of:

(a) traversing said torch with respect to said workpiece to be surfaced at a first speed;

(b) initiating and increasing a weld current and plasma arc to a predetermined level over a predetermined period of time;

(c) initiating feeding into the torch a surfacing material and increasing the feed rate of said surfacing material into said plasma arc during the period of time said weld current is increasing to provide a smooth lead-in on said surfacing;

(d) establishing a substantially constant welding traversing speed at the same time that said surfacing material feeding begins, said welding speed being substantially less than said first speed;

(e) establishing a steady state weld current and surfacing material feed rate and continuing to feed said material to said plasma arc and maintaining said material feed substantially constant at said steady state weld current, and traversing at said constant welding speed for a predetermined period of time required to surface the desired area of said article;

(g) decreasing said welding current at a predetermined rate upon completion of the surfacing of the desired area of said article;

(g) decreasing the feed rate of said surfacing material while said weld current is decreasing to provide a smooth run-out on said surfacing;

(h) operating said weld current at a decreased rate after the feed of said surfacing material has stopped and simultaneously increasing the traversing speed to said first speed; and

(i) extinguishing said weld current.

4,104,506

PROCESS FOR SOLDERING TO LAMINATIONS OF AN ARCING CONTACT FOR A HIGH CURRENT SWITCH

Bernard L. Phillips, Norwood, Mass., assignor to Arrow Hart Inc., Hartford, Conn.

Division of Ser. No. 489,753, Jul. 18, 1974, Pat. No. 4,002,870. This application Sep. 13, 1976, Ser. No. 722,639

Int. Cl.[2] B23K *1/12*

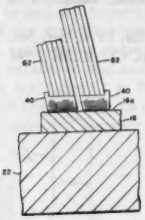
U.S. Cl. 219—85 CM **2 Claims**

1. A process for attaching a metallic element onto an edge of a set of resilient, metallic laminations without distempering the laminations, comprising the steps of

clamping the laminations together at the region of attachment to prevent a liquid flow therebetween,

applying flux and solder between the element and the edges of the lamination,

urging the element against the laminations and the interposed flux and solder, and



rapidly heating the element to fuse the solder and firmly attach the element to the laminations.

4,104,507

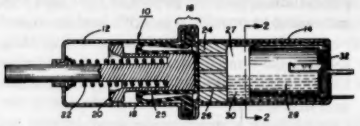
PTC HEATER FOR ENHANCING THERMAL ACTUATOR RESPONSE

Thomas C. Tisone, Thousand Oaks, Calif.; Helmut H. A. Krueger, Elgin, Ill.; Ronald S. Sobecks, Seven Hills, Ohio, and Richard N. Tauber, Rancho Palos Verdes, Calif., assignors to Design & Manufacturing Corporation, Willoughby, Ohio

Filed Jan. 14, 1977, Ser. No. 759,280

Int. Cl.² H05B *1/02*

U.S. Cl. 219—513 **11 Claims**



1. A self-regulating heater for an electrothermal actuator or the like including a working medium expandible upon heating to effect a mechanical output from the actuator, comprising: an integral elongated annulus of a positive temperature coefficient material having a low resistance to electrical current at ambient temperatures and an anomaly temperature above which the resistance of the material rises dramatically; said annulus including thin wall means for providing a relatively high resistance to thermal shock and a fast temperature rise in response to electrical energization; said annulus including inner and outer faces electrically connectible in an electric circuit to produce a heating current across the thin wall thereof; said annulus having a diameter and length for generally maximizing the heating surface area of said inner and outer faces to produce a rapid actuation of said actuator by expanding such a working medium and a relatively small thermal storage capacity, whereby upon termination of such electrical energization said annulus is capable of relatively prompt cooling.

4,104,508

SUPPORT FOR DEFORMABLE ARTICLES AND METHOD OF MAKING THE SAME

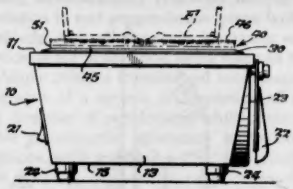
Edward A. Ebert, 203 Huxley Dr., Snyder, N.Y. 14226

Filed Dec. 20, 1976, Ser. No. 752,609

Int. Cl.² H05B *3/06*

U.S. Cl. 219—521 **25 Claims**

1. A support carpet comprised of multitudinous vertically disposed fibers having upper and lower ends, means supporting said lower ends to form a rigid support structure at said lower ends, said support structure comprising a resin, relatively transparent to infrared radiation, said upper ends being positioned for supporting the bottom surface of a heat softened article, each of said fibers being at said upper ends more resilient than said surface so that deformation of said surface cannot



occur while said upper ends of said fibers support said heat softened article.

4,104,509

SELF-REGULATING HEATING ELEMENT

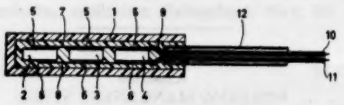
André Marcel Alfred Van Bokestal, and Charles Joseph Ghislain Belhomme, both of Brussels, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 21, 1976, Ser. No. 725,170

Claims priority, application Netherlands, Sep. 23, 1975, 7511173

Int. Cl.² H05K *5/06*

U.S. Cl. 219—544 **8 Claims**



1. In a self-regulating heating device containing at least one resistor body provided with current conductors and consisting of a ceramic body having a positive temperature coefficient electrical resistance, a casing enclosing said resistor body and spaced from said resistor body by heat conducting electrically insulating material surrounding said resistor body and located between said resistor body and said casing, the improvement wherein both the casing and the material located between the casing and the resistor body consist essentially of a vulcanized synthetic resin material capable of resisting the highest operating temperature of said device, an electrically insulating, heat conducting metal compound and a finely divided reinforcing filler material.

4,104,510

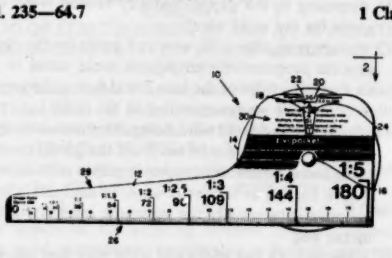
EXPOSURE CORRECTION CALCULATOR FOR TAKING CLOSE-UP PICTURES

Clifford M. Miyashiro, 5267 Tendella Ave., Woodland Hills, Calif. 91364

Filed Oct. 18, 1976, Ser. No. 733,265

Int. Cl.² G06C *3/00*

U.S. Cl. 235—64.7 **1 Claim**



1. A calculator useful in making camera adjustments when taking close-up exposures including:

an elongated member having a first scale, said first scale including indicias imprinted thereon which includes a plurality of spaced numbers disposed along the elongated line of said member and being a measurement indicative of the length of a desired field of view, said scale includes a second row of numbers placed therealong which is indicative of a magnification ratio of the field of view of the exposed closeup exposures;

an extended area on said elongated member being substantially wider than said elongated member and including a window opening therein and a pivot opening spaced substantially below said window opening on alignment therewith; and,

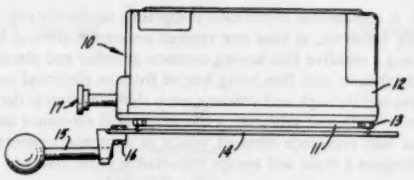
a circular member being pivotally mounted to said pivot opening in said elongated area whereby portions of said circular member being exposed in said window opening of said extended area on said elongated member, said circular member having a plurality of rows of indicia arranged in a circular pattern thereon and each indicia in said row being in a columnar arrangement extending along the radii thereof, each row in said columnar arrangement being indicative of a significant exposure factor for exposure settings on a camera when taking close-up pictures, the outside row of indicia on said circular member being a member corresponding to said numbers indicative of the length of said elongated member scale which is further indicative of the length of desired field of view measured by the scale on said elongated member, each row in its ordinal significance beginning with the outside of said circular member being a calculated figure for the opening of the *f.* stops on said camera, the multiple flash distance *f.* stops on said camera, the multiple film speed rating and the magnification ratio thereof.

4,104,511

SAFETY INTERLOCK SYSTEM FOR PRESET COUNTERS

Howard E. Rittenhouse, Lindenhurst, Ill., assignor to Liquid Controls Corporation, North Chicago, Ill.

Filed Mar. 15, 1976, Ser. No. 666,600
Int. Cl.[2] G06F *15/18*; B67D *5/22*
U.S. Cl. 235—132 R **7 Claims**



1. In combination in an actuating counter of the type in which a predetermined quantity of product to be counted out can be preset thereon, and which operates to terminate product flow through a fluid meter by actuation of off-on flow control valve means in a fluid flow conduit upon count-out of the predetermined quantity,

frame means carried by the fluid meter,

flow control actuating means carried by the frame means and adapted for connection to on-off flow control mechanism,

said flow control actuating means including

firstly, an actuating member which is moveable from a first, flow closed position to a second, flow open position, and returnable to a flow closed position.

secondly, pre-set means operable at any time said actuating member is in a flow closed position for establishing a predetermined quantity of product units to be counted out whereby a desired quantity of product units can be preset on the actuating counter,

thirdly, structural means for moving the actuating member from the second, flow open position, to flow closed position upon count-out of the desired quantity of units established by the preset means, and

fourthly, interlock means disposed in a blocking and unblocking relationship to the preset means,

said interlock means being actuateable simultaneously with movement of said off-on flow control actuating means into a flow on condition,

said interlock means including a blocking member,

said blocking member consisting of an abutment member which is pivoted about an axis which is fixed with respect to the frame means,

said abutment member having a first portion which moves between a blocking position in which it provides an obstruction to the operation of the preset means, and a clearance position in which it provides no obstruction to the operation of the preset means, and

a second portion which is in operative engagement with the actuating member,

said second portion being arranged to be cammed by movement of the actuating member, and thereby interaction between the actuating member and said second portion, from a first position which causes the first portion to be disposed in a locking position, to a second position in which the aforesaid first portion is in a clearance position, and

means for resiliently urging the abutment member into a position in which the first portion obstructs the operation of the preset means,

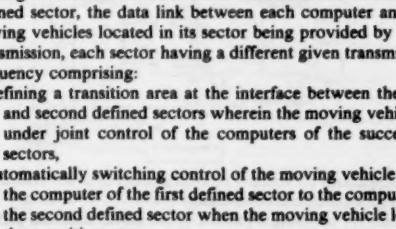
said interlock means further being operable to preclude interference, except in an emergency, with the pre-set means until the quantity of product units established by the pre-set means have been counted out.

4,104,512

COMPUTER CONTROL OF MOVING OBJECTS SUCH AS AIRCRAFT MOVING FROM ONE SECTOR TO ANOTHER

Larry G. Strayer, Chatsworth, Calif., assignor to Hawaiian Trust Company Ltd., Honolulu, Hi.

Filed Nov. 29, 1974, Ser. No. 528,434
Int. Cl.[2] G06F *15/16, 15/48*
U.S. Cl. 364—439 **2 Claims**



1. A method of maintaining continuity of computer control and information exchange between moving vehicles and a computer, with a different computer being operative as a given moving vehicle moves from a first defined sector to a second defined sector, the data link between each computer and the moving vehicles located in its sector being provided by radio transmission, each sector having a different given transmission frequency comprising:

defining a transition area at the interface between the first and second defined sectors wherein the moving vehicle is under joint control of the computers of the successive sectors,

automatically switching control of the moving vehicle from the computer of the first defined sector to the computer of the second defined sector when the moving vehicle leaves the transition area,

transmitting a message from the computer of the first defined

sector to the moving vehicle after completing the switching step informing the latter that control has been switched to the computer of the second defined sector.

polling the moving objects located in each defined sector for information exchange by the computer associated with each defined sector, and

removing a given moving object from the polling list of the first defined sector when the computer of the second defined sector successfully polls the given moving object entering therein.

4,104,513

MAGNETIC RECORDING

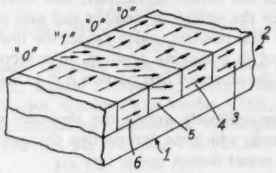
Ralph Reginald Pearce, West Drayton, England, assignor to E M I Limited, Hayes, England

Filed Oct. 14, 1975, Ser. No. 621,862

Claims priority, application United Kingdom, Oct. 16, 1974, 44748/74; Jan. 29, 1975, 3989/75

Int. Cl.[2] G06K *7/08, 19/06;* **G11B** *25/04*

U.S. Cl. 235—450 **2 Claims**



1. A method of examining a magnetic recording medium comprising a permanently structured magnetic material of particles whose preferred axis of magnetisation has been aligned to respective first and second substantially non-orthogonal directions in different regions of the material as a pattern of a distinct magnetic property including:

applying a magnetic field substantially perpendicularly to said second direction to magnetise said particles,

relatively moving the material and a reading head with a gap aligned to the second direction in said second direction to read any variation of remanence in the medium.

4,104,514

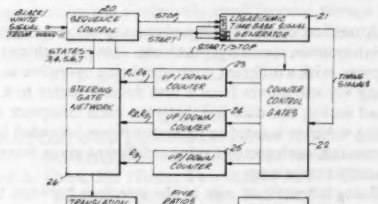
BAR CODE READER AND DECODER

Paul Sherer, Costa Mesa, and Gerald Paul Hester, Santa Ana, both of Calif., assignors to MSI Data Corporation, Costa Mesa, Calif.

Division of Ser. No. 638,056, Dec. 5, 1975, Pat. No. 4,058,708. This application Dec. 13, 1976, Ser. No. 749,879

Int. Cl.[2] G06K *7/10;* **G06F** *11/00;* **G06G** *7/00;* **G06K** *7/016*

U.S. Cl. 235—466 **26 Claims**



1. Apparatus for reading recorded patterns of bar coded data on a record member comprising:

means for scanning a pattern of bar coded data and producing electrical signals representative thereof,

means for producing control signals corresponding to the scanned transitions between segments of the bar coded data,

means for producing logarithmically related timing signals having a preselected logarithmic base other than the base two, coupled to be responsive to a control signal corresponding to a sensed transition to provide timing signals until the next successive transition is scanned and in response to the corresponding control signal,

means for accumulating the timing signals provided during the time interval between scanned transitions, the accumulating means being controlled for accumulating the timing signals for two preselected segments of the bar coded data whereby the result is representative of the ratio of their widths, and

means for assigning a ratio significance to the accumulated result.

4,104,515

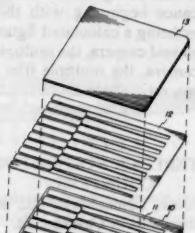
CONSUMABLE CREDIT CARD

David D. Thornburg, Los Altos, Calif., and Roy J. Lahr, Fairfield, Conn., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 3, 1976, Ser. No. 747,150

Int. Cl.[2] G06K *19/02, 19/06*

U.S. Cl. 235—488 **8 Claims**



1. A consumable credit card comprising an electrically insulating substrate, at least one tapered resistance element comprising a resistive film having contacts at either end placed on said substrate said film being heated from an electrical source impressed through said contacts, each element being in thermal contact with said substrate, a thermographic substance coated over said resistance element which at a certain temperature undergoes a rapid and abrupt irreversible color change.

4,104,516

DIRECT VIEW, PANEL TYPE X-RAY IMAGE INTENSIFIER TUBE

Shih-Ping Wang, Los Altos; Charles D. Robbins, Los Altos Hills, and Elisha Merritt, Sunnyvale, all of Calif., assignors to Diagnostic Information Inc., Sunnyvale, Calif.

Filed Jan. 28, 1977, Ser. No. 763,638

Int. Cl.[2] H01J *31/50*

U.S. Cl. 250—213 VT **11 Claims**

1. A directly viewable, x-ray sensitive image intensifier tube comprising:

a metallic tube envelope open at both ends,

an inwardly concave metallic input window at one end of the envelope,

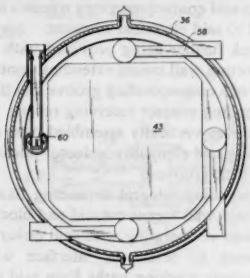
a flat, directly viewable, output phosphor display screen mounted at the other end of the envelope,

a flat, scintillator-photocathode screen,

electrically insulating means for suspending the scintillator-photocathode screen within the envelope and in a plane

parallel to, but spaced apart from, the output display screen, and

means for applying a high, negatively charged, electrostatic potential to the scintillator-photocathode screen, the potential being taken with respect to the output display screen and all of the other tube elements, including the envelope which are at a neutral potential with respect to each other.



4,104,517

METHOD AND OPTICAL SYSTEM FOR AUTOMATIC PARALLAX DETERMINATION

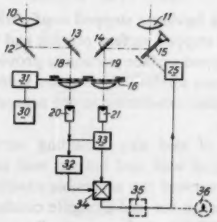
Franz Mesch, Karlsruhe, and Horst Moll, Blankenloch, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH., Wetzlar, Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,604

Claims priority, application Fed. Rep. of Germany, May 5, 1976, 2619795

Int. Cl.² G01J *1/36*

U.S. Cl. 250—204 **21 Claims**



1. A method for automatically generating an electrical signal corresponding to parallax in a steroscopic system, comprising the steps of:

passing at least two imaging light channels through a moving grating structure;

converting said light channels into separate electrical signals after passage through the grating structure;

subtracting one of the electrical signals from the other to produce a signal difference;

differentiating one of the electrical signals to produce a differentiated signal; and

multiplying the signal difference by the differentiated signal to produce a first multiplied signal corresponding to the parallax.

4,104,518

SHUT-DOWN APPARATUS FOR CONVEYOR BELTS IN UNDERGROUND MINES

Martin Schachinger, and Heiko Krüger, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 6, 1976, Ser. No. 747,864

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1975, 2558323

Int. Cl.² G01D *21/04*

U.S. Cl. 250—221 **4 Claims**

1. In a manually-operated, emergency shutdown apparatus for a conveyor belt driven by drive means in an underground mine, the improvement comprising,

laser light beam transmission means, disposed at one of the ends of said conveyor belt and laterally spaced from one of the sides of said conveyor belt, for generating a laser beam in a direction parallel to the longitudinal axis of said conveyor within reaching distance of a person riding on said belt and

laser light beam receiving means, disposed at the other end of said conveyor belt and coupled to said drive means, for receiving said laser beam generated by said transmission means and controlling movement of said conveyor belt in response to manual interruption of said laser beam by a person riding on said belt,

said laser light beam transmission means and receiving means being arranged so that the direction of transmission of said laser beam from said transmission means to said receiving means is opposite the direction of movement of said conveyor belt and said laser light beam receiving means including circuit means for counting the number of interruptions of said laser beam.

4,104,519

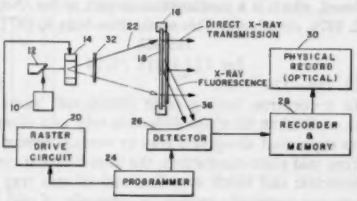
METHOD AND APPARATUS FOR RETRIEVAL OF EXPOSURE INFORMATION FROM FILM IMAGES

William Henry Oldendorf, 2805 Angelo Dr., Los Angeles, Calif. 90024

Filed Oct. 20, 1976, Ser. No. 734,300

Int. Cl.² G01N *23/20*

U.S. Cl. 250—274 **26 Claims**



1. A method of retrieving image information from a photosensitive emulsion comprising the steps of:

selecting a region of an exposed and developed photographic emulsion;

systematically raster scanning the entire selected region of

said emulsion with X-rays on a high density point by point basis;

measuring regionally the resultant fluorescence; and

recording the resultant fluorescence intensity and location.

4,104,520

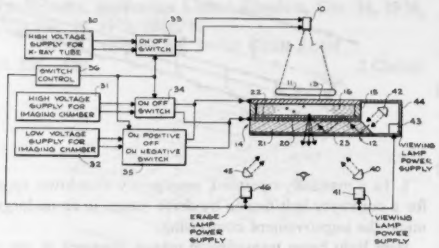
IMAGE CHARGE RELAXATION IN ELECTROPHORETIC DISPLAYS

John H. Lewis; Kathrine J. Lewis, both of Los Angeles; Fremont Reizman, Northridge, and Murray S. Welkowsky, Chatsworth, all of Calif., assignors to Xonics, Inc., Van Nuys, Calif.

Filed May 24, 1977, Ser. No. 800,025

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—315 R **15 Claims**


HIGH VOLTAGE SUPPLY FOR X-RAY TUBE
ON OFF SWITCH
SWITCH CONTROL
HIGH VOLTAGE SUPPLY FOR IMAGING CHAMBER
ON OFF SWITCH
LOW VOLTAGE SUPPLY FOR IMAGING CHAMBER
ON POSITIVE OFF ON NEGATIVE SWITCH
VIEWING LAMP POWER SUPPLY
ERASE LAMP POWER SUPPLY
VIEWING LAMP POWER SUPPLY

1. In an electrostatic imaging chamber for providing a visual image and having

first and second electrodes;

means for supporting said electrodes in spaced relation with a gap therebetween, with said first electrode being relatively transparent optically,

a plurality of electrophoretic particles in said gap, and

means for connecting an electric power source across said electrodes for attracting electrons and negative ions toward one electrode and positive ions toward the other depending upon the polarity of the power source and forming an electrostatic charge image,

the improvement comprising a conductivity control layer at one surface of said gap, with said electrostatic charge image formed at said layer,

with said particles being selectively moved toward said first electrode as a function of said electrostatic charge image forming a visual image viewable through said first electrode, and with said electrostatic charge image being discharged through said layer.

4,104,521

COROTRON CONNECTOR

Henry Otto Herrmann, Jr., Mt. Joy, and Douglas Wade Glover, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 675,412, Apr. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 673,037, Apr. 2, 1976, abandoned. This application May 9, 1977, Ser. No. 795,050

Int. Cl.[2] H01T *19/04*

U.S. Cl. 250—324 **13 Claims**

1. In a corotron having plate conductors mounted on a bottom wall of an elongate dielectric tray and elongate conductors supported along said tray in vertical spaced relationship from said plate conductors, the improvement comprising:

a dielectric end block at a first end of said tray confined between vertically projecting sidewalls of said tray, said end block having integral projecting rigid dielectric bushings encircling conductor means exposed from said bushings for connection to corresponding sources of voltage;

said conductor means projecting into said end block with selected ones electrically inserted in corresponding plate conductors and with selected ones being electrically connected to electrical contacts within top accessible contact receiving recesses provided in said end block;

said elongate conductors having portions thereof received and supported in said top accessible recesses of said end block with further portions of said elongate conductors received in said contact receiving recesses and electrically connected to said electrical contacts;

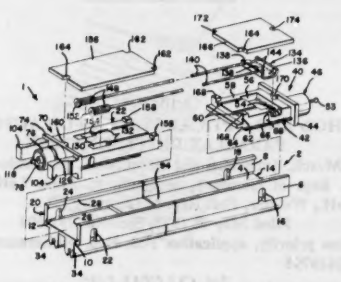
said end block further being provided with integral vertically projecting wall means extending continuously along both sides of a corresponding groove and the perimeter of a corresponding contact receiving recess;

a dielectric cover vertically assembled over said end block and covering said elongate conductor portions received in said end block grooves;

said cover including integral depending flange means surrounding said wall means on said end block;

said wall means cooperating with said cover and with said flange means to define an interface which provides lengthy voltage tracking paths from said recesses to the nearest external surfaces of said cover and the nearest external surfaces of said end block and between internal conductive parts;

said tray bottom wall having a surface portion between one said plate conductors and said one end of said tray;



said end block having a stepped configuration complementary to said stepped surface portion and vertically overlying said stepped surface portion to provide at the interface there between a relatively lengthy voltage tracking path from said plate conductor to the nearest exposed surface of said tray;

another end of said tray including vertically projecting pillars integral with said bottom wall and provided with vertically recessed top accessible cavities containing tensioning recesses for said elongate conductors;

said pillars further including vertically recessed top accessible grooves communicating with an end wall of said pillars and said cavities;

said elongate conductors having portions received and supported in said grooves of said pillars and portions connected to said terminating means;

said elongate conductors extending along said tray in free space between said end block and said pillars;

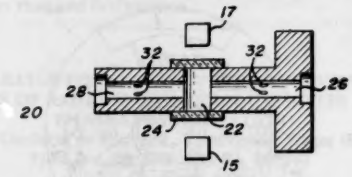
a dielectric cover overlying said pillars and having depending flanges means surrounding said pillar and defining there between relatively lengthy voltage tracking paths from said cavities to the corresponding nearest exposed external surfaces of said tray and of said pillars and between internal conductive parts; and

dielectric partitions integral with said bottom wall of said tray and separating said plate conductors.

4,104,522
APPARATUS FOR MEASURING THE WEIGHT PER UNIT LENGTH OF A CIGARETTE ROD

Peter William Rees, Bexley Heath, England, assignor to Measurex Corporation, Cupertino, Calif.

Filed Mar. 14, 1977, Ser. No. 776,826
Int. Cl.[2] G01N *23/02*
U.S. Cl. 250—359 5 Claims



1. An apparatus for measuring the weight per unit length of a cigarette rod in a cigarette making machine, said apparatus comprises:

a radio-active source to one side of said rod, said source capable of emitting a radiation beam substantially in a radial direction through the rod;

a detector to other side of said rod, said detector capable of receiving said radiation;

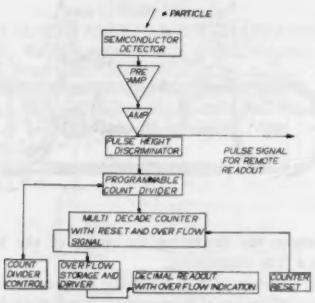
first means for guiding said rod located to one side of said beam, said means having a plurality of ducts for introducing air under pressure to form an air bearing between said means and said rod; and

second means for guiding said rod located to other side of said beam, said means having a plurality of ducts for introducing air under pressure to form an air bearing between said means and said rod.

4,104,523
ELECTRONIC ALPHA PARTICLE COUNTER

Ludwig G. Wolfert, Littleton, Colo., assignor to Martin Marietta Corporation, Rockville, Md.

Filed Oct. 6, 1976, Ser. No. 730,077
Int. Cl.[2] G01T *1/22*
U.S. Cl. 250—370 21 Claims

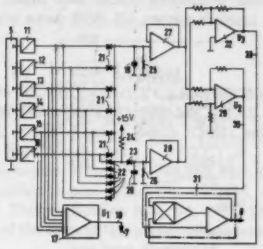


1. In a radon-222 alpha particle counter for detection of radon gas concentrations near the ground surface, including an elongated tubular housing, a semiconductor detector, and circuitry for counting alpha particle impulses, said detector being exposed to a gaseous medium permeable to alpha particles, the improvement which comprises means for attenuating moisture from said gaseous medium.

4,104,524
CIRCUIT ARRANGEMENT FOR A DETECTOR FOR IONIZING RADIATION

Horst Aichinger, Fuerth; Heinz-Erik Kranberg, and Karlheinz Koehler, both of Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 25, 1977, Ser. No. 771,847
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1976, 2610845
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—402 4 Claims

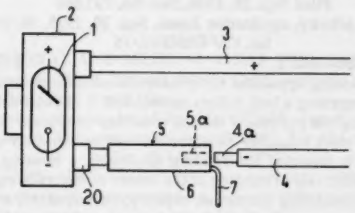


1. An apparatus for producing an ionizing radiation image, having a detector for ionizing radiation with at least three measurement fields and operable for supplying respective output signals as a function of the radiation impinging on the respective fields thereof, a computer circuit for forming a difference signal which corresponds to the difference between the greatest and the smallest output signals of the measuring fields, a computer circuit for forming a sum signal which corresponds to the sum of the greatest and the smallest output signals of the measuring fields, and a division circuit for supplying a quotient signal corresponding to the difference signal divided by the sum signal, as a measure of dosage contrast over the region of the measurement fields of the image, and means for adjusting said contrast.

4,104,525
X-RAY DIAGNOSTICS INSTALLATION COMPRISING A SHORT-TERM SWITCHING MECHANISM

Kurt Franke, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 8, 1977, Ser. No. 785,748
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1976, 2637161
Int. Cl.[2] H05G *1/56*
U.S. Cl. 250—402 2 Claims



1. An x-ray diagnostics installation comprising an x-ray tube having a housing and terminal means connected to one of the electrodes of the x-ray tube, a high voltage cable for connection with the one electrode, and a switching mechanism for a short-term switching on of the x-ray tube, characterized in that the switching mechanism is mounted directly at the x-ray tube

housing between said terminal means of the x-ray tube and an end of said high voltage cable.

4,104,526

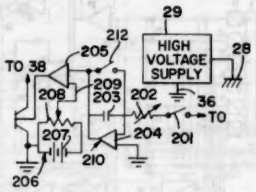
GRID-CATHODE CONTROLLED X-RAY TUBE

Richard D. Albert, 317 Hartford Rd., Danville, Calif. 94526

Continuation-in-part of Ser. No. 353,451, Apr. 24, 1973, Pat. No. 3,925,660, which is a continuation-in-part of Ser. No. 251,378, May 8, 1972, abandoned. This application Dec. 8, 1975, Ser. No. 638,434

Int. Cl.[2] G03B *41/10*

U.S. Cl. 250—403 **15 Claims**



1. Apparatus for pulsing the current output of an X-ray tube over a given time interval to produce a measurable value of anode current that is indicative of actual X-ray production by said tube, said tube having a single anode including at least one target adapted to generate X-rays upon bombardment by an electron beam, and electron gun means including a cathode for generating said electron beam and a control grid for modulating or suppressing substantially the entire electron flow from said cathode to said single anode, said electron gun means being positioned at the opposite end of an evacuated tube containing said anode, comprising

a high potential source,

means for applying relatively high negative potentials to said cathode and said control grid from said source,

means for connecting said single anode to the ground side of said high potential source,

means for detecting return current flow from said anode through said connecting means to said ground side of said high potential source as a measure of actual X-ray production during said given time interval, and means for controlling the potential difference between said cathode and control grid in accordance with said return current flow from said anode as a measure of actual X-ray production during said given time interval.

4,104,527

SCANNING APPARATUS FOR CROSS-SECTIONAL INSPECTION EQUIPMENT

Chuji Tomita, Tokyo, and Hiroshi Abe, Kashiwa, both of Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

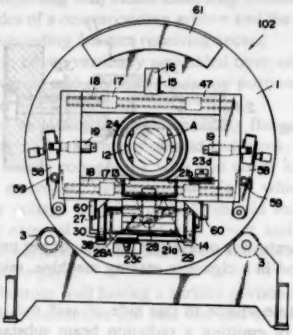
Filed Sep. 29, 1976, Ser. No. 727,866

Claims priority, application Japan, Sep. 30, 1975, 50/117122

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—445 T **8 Claims**

1. A scanning apparatus for cross-sectional inspection equipment, comprising a bed, rollers on said bed, a circular rotating disc having the periphery thereof rotatably supported on said rollers, a shaft rotatably mounted on said bed and on which said disc is mounted for rotation therewith, a housing positioned on the axis of rotation at the center of said rotating disc for accommodating therein an object to be inspected, a movable frame surrounding said housing, guide rails on said rotating disc on which said movable frame is mounted for travel along a required cross-sectional inspection plane of the object, an X-ray source and a detector mounted on said movable frame in positions opposed to each other with said housing therebetween, and drive means for driving said movable frame reciprocally along said rails and rotating said rotating disc in accordance with the travel of said movable frame, said drive means having a single driving source, an intermittent transmission gear on said disc and driven by said driving source, a barrel cam rotatably mounted on said rotating disc and driven for constant rotation from said drive source and having a cam groove with which said movable frame is engaged for driving said movable frame reciprocally along said guide rails, a worm rotatable around its own axis and fixed to said shaft for rotation around said shaft with the axis of rotation of the worm transverse to the axis of the shaft, said worm being rotated by the intermittent transmission gear, a worm gear loosely mounted on said shaft and meshing with said worm, and means engaged with said worm gear for blocking rotation of said worm gear relative to said shaft, said intermittent transmission gear driving said worm for rotating said disc a small amount when the direction of travel of said movable frame is reversed by said barrel cam.



4,104,528

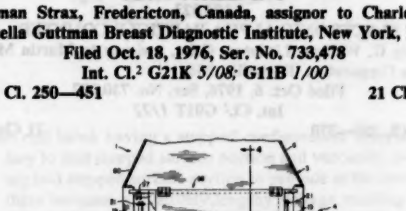
AUTOMATED MAMMOGRAPHY APPARATUS FOR MASS SCREENING

Norman Strax, Fredericton, Canada, assignor to Charles & Stella Guttman Breast Diagnostic Institute, New York, N.Y.

Filed Oct. 18, 1976, Ser. No. 733,478

Int. Cl.[2] G21K *5/08*; G11B *1/00*

U.S. Cl. 250—451 **21 Claims**



1. Apparatus for recording an image of the breast of a woman on a film comprising:

a surface member having a surface adapted to support the breast while exposed to energy for irradiating the breast to form an image of the breast in a plane spaced from said supporting surface;

means for urging said film into the plane of said image for recording said image on said film;

means for supplying a continuous roll of said film for recording images therealong;

take-up means for sequentially storing sections of said film after each section has an image recorded thereon;

movable transport means for advancing said film from said supply means to said take-up means; and

means for selectively evacuating the space between said film and said film urging means for moving said film urging means into a first position in contact with said film and for repressurizing said space to move said film urging means to a second position displaced from said film;

said transport means being responsive to the pressure between said film and said urging means so that said film is advanced only when said urging means is in a position other than said first position.

4,104,529

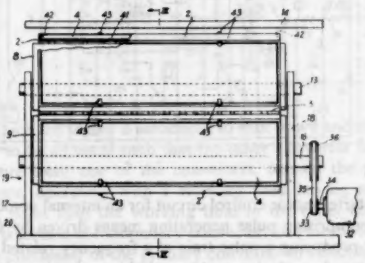
APPARATUS FOR SUCCESSIVELY POSITIONING A SERIES OF RADIOGRAPHIC FILM CASSETTES AT A FILM-EXPOSING STATION

Jacques Gaudel, 5 du Tertre St., Remiremont, France (88200)

Filed Dec. 14, 1976, Ser. No. 750,532

Int. Cl.[2] G11B *1/00*

U.S. Cl. 250—470 **9 Claims**



1. An apparatus for successively positioning a series of radiographic film cassettes at a film-exposing station, comprising a chain, the links of which consist of boxes hinged one to the other and each carrying a radiographic film cassette, said chain being trained on two polygonal drums having flat faces, the width of each face equal to the length of a chain link, mounted for rotation on two parallel shafts, the distance between the rotation axes of said drums being equal to the length of a chain link multiplied by a whole number, said shafts being mounted parallel to a patient-examining plane and at a distance from this plane as small as possible without preventing rotation of the drums.

4,104,530

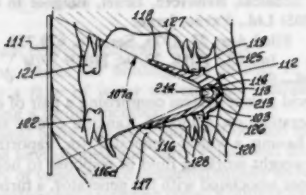
DENTAL AND MEDICAL X-RAY APPARATUS

Mortimer E. Weiss, Laguna Beach, Calif., assignor to Thoro-Ray Inc., Santa Ana, Calif.

Continuation-in-part of Ser. No. 672,608, Apr. 1, 1976, abandoned. This application Oct. 4, 1976, Ser. No. 728,959

Int. Cl.[2] H01J *35/00*; H05G *1/00*

U.S. Cl. 250—490 **21 Claims**



1. In dental X-ray apparatus,

(a) X-ray tube means for providing an electron beam,

(b) a target for said beam carried by said means and spaced therefrom to be received rearwardly into a patient's mouth,

(c) a carrier element projecting rearwardly of the tube means and carrying said target, said carrier element and target being interconnected,

(d) and X-ray shielding and tongue suppressing means carried by said carrier element to be received into the patient's mouth, and characterized in that when the target is located at one side of the mouth to direct an X-ray beam toward teeth at the opposite side of the mouth the shield will protect portions of the head from the X-ray beam and the patient's tongue will be suppressed relative to the X-ray beam, said means projecting sidewardly of and relatively away from the carrier element.

4,104,531

ELECTRON BEAM TARGET CARRIER WITH CERAMIC WINDOW FOR DENTAL OR MEDICAL X-RAY USE

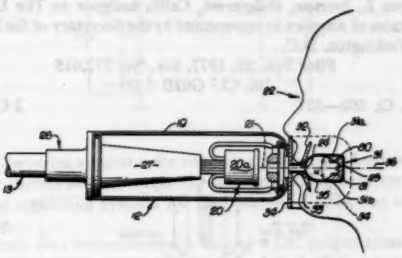
Mortimer E. Weiss, Laguna Beach, Calif., assignor to Thoro-Ray Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 728,959, Oct. 4, 1976, which is a continuation-in-part of Ser. No. 672,608, Apr. 1, 1976, abandoned. This application Mar. 14, 1977, Ser. No. 777,133

The portion of the term of this patent subsequent to Aug. 1, 1995, has been disclaimed.

Int. Cl.[2] H01J *35/00*; H05G *1/00*

U.S. Cl. 250—490 **17 Claims**



1. In dental X-ray apparatus, the combination comprising

a. X-ray tube means for providing an electron beam,

b. a target for said beam, and

c. a carrier for said target and locating the target in longitudinally spaced relation from said means to be received rearwardly into a patient's mouth,

d. said carrier defining a tubular X-ray absorbing shield, and there being a ceramic element defining an X-ray window carried by the carrier and positioned to sidewardly laterally pass X-rays emanating from the target, said shield extending at the side of the target spaced from the window, the shield and target being integrally connected.

4,104,532

DENTAL AND MEDICAL X-RAY APPARATUS

Mortimer E. Weiss, Laguna Beach, Calif., assignor to Thoro-Ray Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 672,608, Apr. 1, 1976, abandoned. This application Jun. 29, 1977, Ser. No. 811,160

Int. Cl.[2] H01J *35/00*

U.S. Cl. 250—490 **19 Claims**

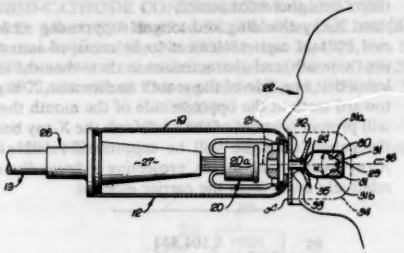
1. In dental X-ray apparatus

(a) X-ray tube means providing an electron beam,

(b) a beam target carried by said means and located axially rearwardly thereof to be received rearwardly into a patient's mouth,

(c) the target angled relative to said axis to produce a radiation pattern that extends forwardly of the target and also rearwardly and sidewardly of the target, said X-ray tube means including structure to cause the electron beam to

form a beam impingement spot on the target of sufficiently small size that radiation emanating from said spot and directed toward a tooth and film produce a sharp boundary tooth image on the film, and



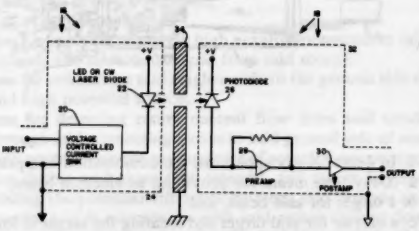
(d) an X-ray absorbing shield adjacent the target rearwardly thereof and extending forwardly at the side of the target, the shield and target being integrally connected, the shield defining a probe that projects rearwardly for reception into the patient's mouth.

4,104,533

WIDEBAND OPTICAL ISOLATOR

Myren L. Iverson, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 28, 1977, Ser. No. 772,615
Int. Cl.[2] G02B 5/00
U.S. Cl. 250—551 **2 Claims**



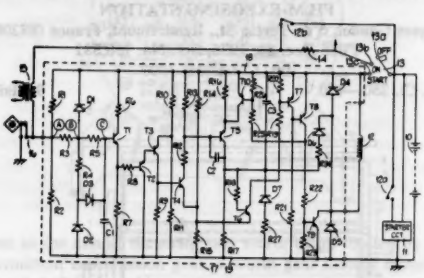
1. A large bandwidth analog optical isolator comprising:
a linear voltage controlled current sink capable of being modulated for a large bandwidth signal;
a linear fast optical rise time light emitting diode, LED, operatively attached to the current sink for transmitting an optical signal;
a first shield around the current sink and LED tied to the sink input ground for protecting the sink and LED from stray charge;
a hole in said first shield appropriately placed for permitting the optical signals from the LED to pass through;
a PIN photodiode with a linear fast rise time for receiving the optical signal placed in the path of said optical signals;
a linear transimpedance preamplifier operatively connected to the photodiode for amplifying the signal;
a postamplifier operatively attached to the preamplifier for increasing the signal to the predetermined level needed for desired output;
a second shield around the photodiode and amplifiers tied to the sink output of the postamplifier for protecting the photodiode and amplifiers from stray charge and with a hole for permitting access of the optical signal; and
a chassis grounded metal plate placed between said shields and separated therefrom by an air gap on both sides for preventing capacitive coupling between the first and second shield with a hole in said metal plate properly placed and sized for transmitting the optical signal through it from the LED to the photodiode.

4,104,534

STARTER MOTOR CONTROL CIRCUIT FOR AN INTERNAL COMBUSTION ENGINE

William Frank Hill, Stafford, and John Peter Southgate, Sutton Coldfield, both of England, assignors to Lucas Electrical Limited, Birmingham, England

Filed Apr. 9, 1976, Ser. No. 675,357
Claims priority, application United Kingdom, Apr. 15, 1975, 15360/75
Int. Cl.[2] F02N 11/06; H02P 9/04
U.S. Cl. 290—37 A **12 Claims**



1. A starter motor control circuit for an internal combustion engine comprising pulse generating means driven by the engine for producing a pulse train at a frequency related to the engine speed, a starter motor switching circuit switchable between a first state in which starter motor operation is permitted and a second state in which such operation is inhibited, frequency sensitive means connecting the pulse generating means to the starter motor switching circuit and operating to switch said circuit to its first or second state according to the frequency of the pulse train, means responsive to the state of the starter motor switching circuit for changing the mode of operation of the frequency sensitive means, the frequency sensitive means acting as a frequency voltage converter when the starter motor switching circuit is in its first state and operating to switch the starter motor switching circuit to its second state when the frequency of the pulse train exceeds its predetermined value, and operating as a pulse resettable timer circuit which is reset by each pulse of said pulse train when the starter motor switching circuit is in its second state and acts until the expiry of the timer circuit output duration, i.e. until no pulses of said pulse train have occurred during the period exceeding the timer circuit output duration, to prevent the starter motor switching circuit from reverting to its first state.

4,104,535

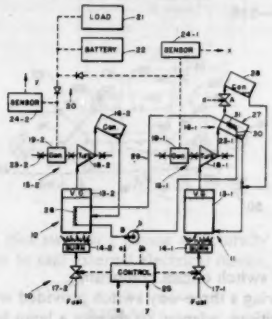
HYBRID ELECTRIC POWER GENERATING SYSTEM

Yehuda L. Bronicki, Rehovoth, Israel, assignor to Ormat Turbines (1965) Ltd., Yavne, Israel

Filed Apr. 23, 1976, Ser. No. 679,757
Int. Cl.[2] F01K 23/04; H02P 9/04
U.S. Cl. 290—52 **14 Claims**

1. A hybrid power system comprising a pair of energy converters operating on a closed Rankine cycle, each energy converter having a vapor generator for vaporizing a high molecular weight working fluid in response to heat furnished from a burner associated with the generator, a turbo-generator responsive to vaporized working fluid for generating electrical power, a condenser responsive to the the exhaust vapors from the turbo-generator for converting such vapors into a condensed liquid, and means for returning the condensed liquid to the vapor generator; a sensor associated with each converter

and responsive to the output of its turbo-generator for producing a control signal when the output drops below a threshold; and a control system responsive to the sensors for controlling the burners in the converters, the system being responsive to the absence of a control signal for causing the burners to be adjusted such that each converter furnishes about half the electrical load on the system, and being responsive to a control signal from a sensor for causing the burner of the converter



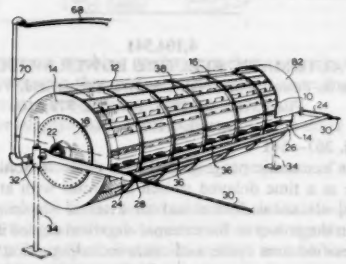
with which the sensor is associated to shut down and the other burner to be adjusted such that the other converter furnishes the entire load; one of the converters, termed the primary converter, operating with a working fluid having a higher boiling point than the working fluid in the other converter which is termed the secondary converter, and means for causing the condenser of the primary converter to reject heat into the vapor generator of the secondary converter when both turbo-generators are operating normally.

4,104,536

STREAM -OR RIVER-POWERED TURBINE

Anton Franz Gutsfeld, 13 London St. N., Hamilton, Ontario, Canada (L8H 4B2)

Filed Apr. 27, 1976, Ser. No. 680,684
Int. Cl.[2] F03B *13/00*
U.S. Cl. 290—54 **4 Claims**



1. A stream powered turbine, comprising

restraining means for holding said turbine in the stream against a flow of water therein, said restraining means including a torque member;

an elongated body rotatably mounted on said torque member and having inner and outer cylindrical surfaces;

a plurality of vanes spaced circumferentially about said body outer surface and extending radially outwardly therefrom, each of said vanes having at least one opening therethrough;

a valve member mounted on each vane adjacent each opening and severally adapted to uncover the associated opening upon encountering a tail wave, to close such opening while such vane is in the stream, and to uncover such opening as such vane exits the stream;

a generator mounted on said torque member within said body;

drive means arranged within said body and operative to transmit rotational movement of said body to said generator, said drive means including an endless chain fastened to said body inner surface and a sprocket engaging said chain and arranged to drive said generator; and

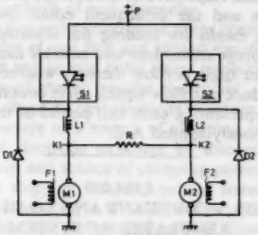
a casing mounted on said body inner surface and enclosing said chain except proximate said sprocket.

4,104,537

STATIC CONVERTER EQUIPMENT

Sten Elvin, Vesteras, Sweden, assignor to ASEA AB, Vesteras, Sweden

Filed Dec. 17, 1976, Ser. No. 751,563
Claims priority, application Sweden, Dec. 29, 1975, 7514669
Int. Cl.[2] H02J *1/10*
U.S. Cl. 307—58 **9 Claims**



1. Converter apparatus for supplying at least two loads with direct current without requiring large smoothing inductors or special regulating systems for load current distribution comprising:

at least two converters each having a DC output terminal, each converter operating in phase shifted relation to other converters,

a load for each converter, each load having an input terminal connected to an output terminal of the corresponding converter, each load having a resistance R and impedance Z,

the improvement comprising impedance means galvanically interconnecting the input terminals of said loads, said impedance means having a resistance RZ of at least the same order of magnitude as the resistance of said loads, the impedance ZZ of said impedance means having a value at the most the same order of magnitude as the load impedance.

4,104,538

DIGITALLY SYNTHESIZED BACK-UP FREQUENCY

Thomas J. Davies, Jr., San Jose, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Apr. 29, 1977, Ser. No. 792,155
Int. Cl.[2] H02J *9/00*
U.S. Cl. 307—64 **11 Claims**

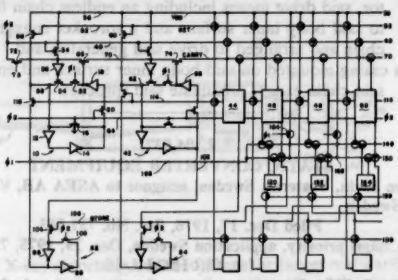
1. A.C. back-up frequency synthesizer circuitry for generating signals precisely indicative of the half-period of an applied A.C. frequency after removal of said frequency, said synthesizer circuitry comprising:

high frequency generating means for producing a continuous train of pulses at a substantially constant frequency several orders of magnitude greater than the frequency of the applied A.C.;

counting means coupled to said high frequency generating means and reset by the occurrence of a positive line transition denoting the beginning of a cycle of said applied A.C.

for counting the number of pulses between said occurrences;

count storage means coupled to said counting means for storing the count, excluding the lease significant digit thereof, reached by said counting means between said occurrences of positive line transitions; and



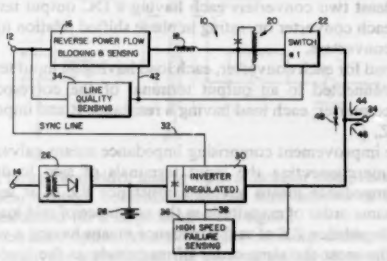
loading means responsive to the absence of said positive line transition and the subsequent count overflow of said counting means for loading the inverted value in said count storage means into said counter including the least significant digit portion thereof, whereby said counter will produce overflow signals upon counting a number of pulses representing each half-period of the frequency of the previously applied A.C.

4,104,539

PARALLEL REDUNDANT AND LOAD SHARING REGULATED AC SYSTEM

Alfred Max Hase, 6 Manorwood Rd., Scarborough, Ontario, Canada

Filed Apr. 5, 1976, Ser. No. 673,820
Int. Cl.[2] H02J *7/00*
U.S. Cl. 307—64 **11 Claims**



1. In an electrical power system having two power sources, where at least the first power source is an ordinarily available alternating current having a voltage regulator in series therewith, and the second power source is synchronized to said first power source; and where the load is an alternating current load which is connected to both power sources so that during normal operation the load demand is shared by said power sources, the improvement comprising:

failure sensing and voltage and power isolation control means associated with said second power source, and adapted to sense failure of said second power source and to isolate it, voltage and power-wise, from said load in the event of failure thereof;

reverse power flow sensing means associated with said voltage regulator and said first power source for sensing reverse power flow towards said first power source; and

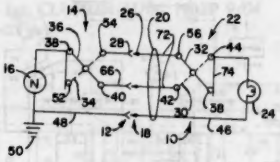
reverse power flow blocking means actuable by said reverse power flow sensing means for blocking reverse power flow in a direction from said load towards said first power source upon sensing reverse power flow by said reverse power flow sensing means so as to isolate said first power source, voltage and power-wise, from said load when said reverse power flow is sensed.

4,104,540

LAMP SWITCH CIRCUIT

Del R. Lien, 143 Eastview Dr. NW., Cedar Rapids, Iowa 52405

Filed Aug. 23, 1977, Ser. No. 826,994
Int. Cl.[2] H01R *13/70*
U.S. Cl. 307—114 **4 Claims**



1. A lamp switch circuit comprising:

a lamp having a three-way switch provided with two operative positions, adapted to receive a lamp bulb, said lamp switch including three contact elements, two of which are connected in series in the operative position of said switch, and a reciprocating switch element, and means on said switch element for alternately connecting two of said three contact elements, said alternate connecting means including

a coil spring connected to one end of said switch element adapted to be snapped over a center pedestal in response to reciprocable movement of said switch element, and

a contact bar for alternately bridging two of said three contact elements in response to reciprocable movement of said switch element.

a three-way wall-mounted switch provided with two operative positions remotely located from said lamp adapted to be connected to a source of electrical power, and

means for directly connecting said lamp switch and wall-mounted switch in series to operate said lamp from either one of said switches.

4,104,541

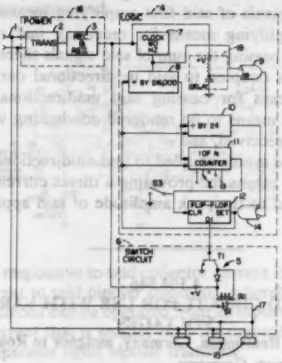
AUTOMATIC ELECTRIC POWER SWITCH

William R. Jewell, 8600 Nan Lee Dr., Springfield, Va. 22152

Filed Mar. 18, 1977, Ser. No. 779,010
Int. Cl.[2] H01H *7/00*
U.S. Cl. 307—141 **12 Claims**

1. An automatic programmed time delay switching device for use as a time delayed switch in circuit with at least one external electrical device and an external electrical source, wherein the power to the external electrical device is switched in a specified time cycle, said cycle including a first automatic switch setting when power is initially applied to the switching device and when said cycle is completed and a second automatic switch setting at a specified time delay after said first switch setting, said switching device comprising a power input means structurally adapted to receive power from said external electrical source and to conduct the power to the electrical circuitry of the switching device, switch timing means in circuit with said source and said power input means for measuring said specified time delay after power is applied to the switching device and generating a switch control signal, timing circuit initialization means in circuit with said switch timing means for initializing said timing means when power is first applied to said switching device, switching means in circuit with said external source and said timing means for switching

on or off the power to said external electrical device in response to said switch control signal, and power output means



in circuit with said switching means structurally adapted to distribute power to said external electrical device.

4,104,542

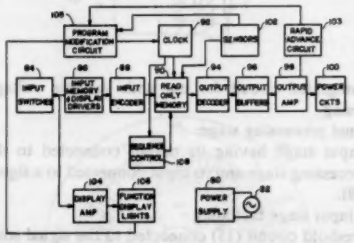
PROGRAM MODIFICATION CIRCUIT FOR ELECTRONIC APPLIANCE PROGRAMMER

Joseph Karklys, and Junji Cary Yamanaka, both of St. Joseph, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Continuation-in-part of Ser. No. 688,092, May 19, 1976, abandoned. This application Dec. 9, 1976, Ser. No. 748,778

Int. Cl.[2] H01H *7/00, 43/00*

U.S. Cl. 307—141 **7 Claims**



1. An automatic washing appliance including an electronic control for stepping the appliance through an operating program comprising a sequence of operations,

a clock for supplying electrical pulses at discrete timer intervals,

a sequence control for establishing said sequence of operations,

a memory circuit connected to said clock and said sequence control for generating a sequence of output signals,

a plurality of output circuits connected to said memory circuit for performing said operations in response to said output signals, and

sensing means connected to said memory circuit for generating a sensing signal indicating a condition of the appliance,

an improved program modification means connected to said output circuits, said sensing means and said clock for modifying the length of at least one of said discrete time intervals, comprising:

switching means and a gate and responsive to said sensing signal for modifying said operating program, said sensing means comprising a water level sensing switch for generating a signal indicative of the water level in said washing appliance.

4,104,543

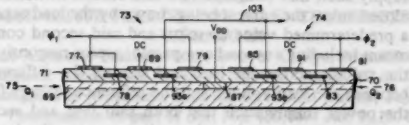
MULTICHANNEL CCD SIGNAL SUBTRACTION SYSTEM

Dale G. Maeding, Carlsbad, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 22, 1977, Ser. No. 770,556

Int. Cl.[2] G11C *19/28;* **H01L** *29/78*

U.S. Cl. 307—221 D **6 Claims**



1. A method of subtracting a first signal from a second signal comprising the steps of:

(a) providing, in a semiconducting substrate first and second individual charge flow channels, extending first and second sets of charge transfer electrodes over respective ones of said channels, and extending an equipotential electrode structure over both of said channels;

(b) generating first and second pulse trains corresponding to the amplitudes of said first and second signals and applying said first and second pulse trains respectively to said first and second charge transfer electrodes;

(c) alternately clamping said electrode structure by connecting said structure to a source of clamping potential and floating said electrode structure by disconnecting said structure from said source of clamping potential;

(d) alternately stepping first and second trains of charge packets corresponding to said first and second pulse trains along said first and second charge flow channels respectively, into and out of the substrate region under said equipotential electrode structure so that each time said electrode structure is clamped, charge is shifted under it from one of said channels and each time it floats, charge is shifted under it from the other of said channels; and

(e) detecting the potential of said electrode structure when it floats.

4,104,544

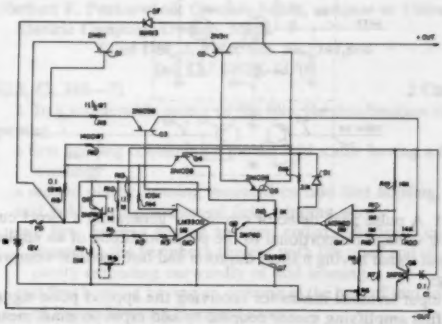
CURRENT LIMITING CIRCUIT FOR DIRECT CURRENT POWER SUPPLIES

Robert A. Bradburn, Pittsburgh, Pa., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Mar. 16, 1977, Ser. No. 778,271

Int. Cl.[2] H03K *1/02*

U.S. Cl. 307—297 **4 Claims**



1. A circuit for limiting the output from a constant voltage, single direct current power supply to a load, said circuit comprising:

first and second transistor switches connected in series be-

tween the power supply and load for controlling the passage of current from the power supply to the load;

third and fourth transistor switches for controlling said first and second switches, respectively; and

first and second control means for controlling said third and fourth switches, said first control means including a first comparator means responsive to the current being drawn by the load and sensing the differential between the load current and the current limit reference from the power supply such that both said first and second switches are closed unless the current being drawn by the load exceeds a predetermined value therefor, and said second control means including a second comparator means responsive to the voltage across the load and sensing the differential between the load voltage and the reference voltage from the power supply such that both said first and second switches are open when the voltage across the load is below a predetermined value therefor, at least one of said control switches being in a nonconductive state when an output switch is in a nonconductive state to eliminate stand-by drain from the single power source.

4,104,545

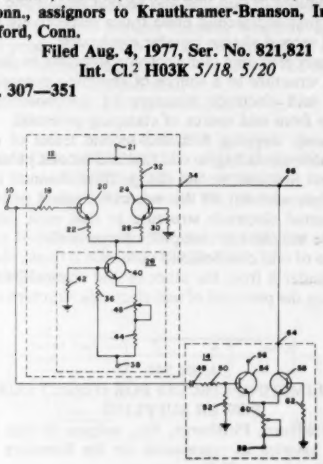
PULSE PEAK DETECTOR CIRCUIT

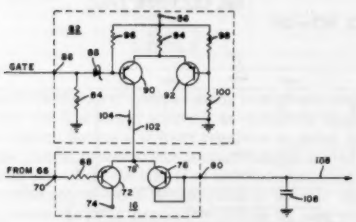
Gary S. Dallas, Monroe, and Richard J. Pittaro, Stamford, both of Conn., assignors to Krautkramer-Branson, Incorporated, Stratford, Conn.

Filed Aug. 4, 1977, Ser. No. 821,821

Int. Cl.[2] H03K *5/18, 5/20*

U.S. Cl. 307—351 **10 Claims**





1. A pulse peak detector circuit for generating a direct current voltage proportional to the peak amplitude of an applied input signal having a short duration and fast rise time comprising:

input terminal means for receiving the applied pulse signal;

first amplifying means coupled to said input terminal means for receiving said applied pulse signal and providing at its output terminal a signal for compensating for a small amplitude pulse signal;

second amplifying means coupled to said input terminal means for receiving said applied pulse signal for providing at its output terminal a signal commensurate with said applied input pulse signal;

unidirectional current conducting means coupled to said output terminals of said first amplifying means and said second amplifying means for receiving said respective signals and passing the sum of said signals therethrough;

current means coupled to said unidirectional current conducting means for causing said unidirectional current conducting means to be rendered conducting when said signals are received, and

charge storage means coupled to said unidirectional current conducting means for providing a direct current voltage proportional to the peak amplitude of said applied pulse signal.

4,104,546

INTEGRATED CIRCUIT FOR USE WITH VARIABLE VOLTAGES

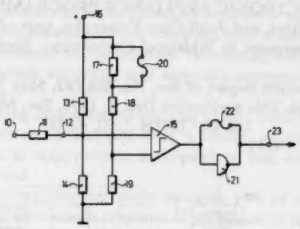
Hartmut Seiler, Reutlingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 17, 1977, Ser. No. 769,431

• **Claims priority, application Fed. Rep. of Germany, Apr. 6, 1976, 2614781**

Int. Cl.[2] H03K *5/20, 19/40*

U.S. Cl. 307—362 **9 Claims**



1. Integrated circuit for use with variable voltage inputs comprising

a signal processing stage;

an input stage having its output connected to the signal processing stage and its input connected to a signal source (**10**),

said input stage including

a threshold circuit (**15**) connected to the signal source;

a voltage divider (**13, 14; 17, 18, 19**) having a plurality of circuit components connected to the threshold circuit (**15**) and determining its threshold response level, and

at least one burn-off shunt path (**20**) connected in parallel with at least one circuit component (**17**) of the voltage divider to permit modification of the response level of the threshold circuit (**15**) with respect to a predetermined signal level of the input signal source.

4,104,547

EXTENDED RANGE CURRENT-TO-TIME CONVERTER

Thomas M. Frederiksen; Robert S. Sleeth, both of San Jose, and William M. Howard, Campbell, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 21, 1977, Ser. No. 779,393

Int. Cl.[2] H03K *5/153, 5/20*

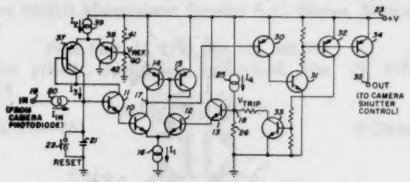
U.S. Cl. 307—362 **8 Claims**

1. A comparator circuit for sensing the difference between an input potential applied to one side thereof and a reference potential applied to the other side and providing an output when said input potential exceeds said reference potential by a predetermined amount, said comparator circuit comprising:

a bipolar transistor connected into said one side of said

comparator circuit to provide an input for receiving said input potential on the base thereof;

means for sensing the flow of collector current in said bipolar transistor; and



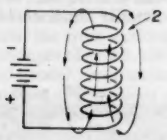
means responsive to said collector current for supplying base current to said bipolar transistor, whereby said comparator circuit can be operated from an input source supplying a current that is smaller than the current required by the comparator input bipolar transistor.

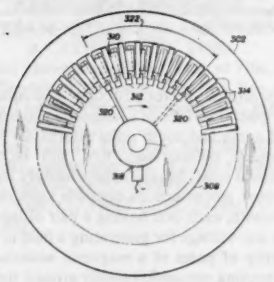
4,104,548

ELECTRIC MOTOR FOR GENERAL PURPOSES (II)

Domenic Borello, 142 Nyack Ave., Pelham, N.Y. 10803

Division of Ser. No. 640,974, Dec. 15, 1975, Pat. No. 4,020,370.
This application Nov. 17, 1976, Ser. No. 742,421
Int. Cl.[2] H02K *41/00*
U.S. Cl. 310—14 **1 Claim**





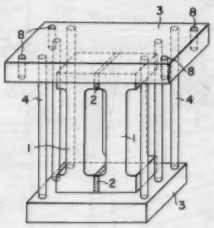
1. In an electric motor of the type including at least one coil having a central opening and electrically connected to generate a magnetic field, and a magnetizable body carried at the periphery of a rotor adapted to be powered in rotation by said field, the improvements comprising said coil of said magnetic field being in the specific form of individual helical turns disposed in a circumferential arrangement with said central opening in each said helical turn located along the contemplated rotary path of said rotor magnetizable body, each said helical turn having a segment missing therefrom in an area thereof coincident with said rotary path of said rotor magnetizable body, means supporting said rotor in an operative relation to said magnetic field coil such that said central openings of said helical turns occupy a position in surrounding relation to said contemplated rotary path of said magnetizable body of said rotor, and a select number of electrically conductive segments disposed in circumferential relation to each other in said rotor in advanced relation to said magnetizable body thereof, said conductive segments being disposed in locations effective to electrically complete corresponding helical turns with which said conductive segments establish contact, whereby said helical turns in said completed condition are effective when energized to generate a magnetic field powering said rotor in rotation.

4,104,549

MAGNETITE FERRITE FOR MAGNETOSTRICTIVE VIBRATORS

Yumi Akimoto; Tamotsu Ishii, both of Omiya; Motohiko Yoshizumi, Urawa, and Sadaaki Haghino, Omiya, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 484,883, Jul. 1, 1974, abandoned. This application Apr. 27, 1976, Ser. No. 680,669
Claims priority, application Japan, Jul. 3, 1973, 48-74415; Jul. 7, 1973, 48-76131; Jul. 7, 1973, 48-76133; Jul. 7, 1973, 48-76134; Jan. 28, 1974, 49-10982; Feb. 4, 1974, 49-13760; Apr. 10, 1974, 49-39820; Apr. 15, 1974, 49-41875; United Kingdom, Jul. 3, 1974, 29453/74; Fed. Rep. of Germany, Jul. 2, 1974, 2431698; Netherlands, Jul. 2, 1974, 7408914; France, Jul. 3, 1974, 74 23131
Int. Cl.[2] H01L *41/06*
U.S. Cl. 310—26 **8 Claims**



1. A method for generating magnetostrictive vibration which comprises:

providing a vibrator element comprising a sintered structure of magnetite having an oxygen/iron (O/Fe) atomic ratio within the range of 4.0/3 to 4.1/3, a specific resistance of not less than 0.1 ohm.cm, and a positive static magnetostriction and containing cobalt in a quantity of 0.01 to 1.0% by weight of the sintered structure; and applying an alternating magnetic field to the vibrator element.

4,104,550

MOTOR SEALS

Herbert F. Penhorwood, Owosso, Mich., assignor to Universal Electric Company, Owosso, Mich.

Filed Dec. 3, 1976, Ser. No. 747,064
Int. Cl.[2] H02K *11/00*
U.S. Cl. 310—71 **2 Claims**

1. In a submersible motor or the like, the combination comprising

a first housing containing a motor field stator having a field winding,

a second plastic housing mounted on said first housing,

said field having unencased field winding wires,

said first housing having an open ended cylindrical cavity therein in the periphery thereof with the open end of said cavity extending outwardly of said housing,

said first housing having an opening in the base of said cavity of lesser diameter than said cavity,

a cylindrical body of compressible elastomeric material positioned in said cavity,

said body being shaped such that it has a lower cylindrical portion and an upper frusto-conical portion which has a maximum diameter at the juncture with the cylindrical

portion which is less than the diameter of the cylindrical portion,

said cylindrical portion of said body having a diameter which conforms with the diameter of the cavity so that said body can be readily inserted in said cavity without substantial compression and which is greater than the diameter of said opening in the base of said cavity,

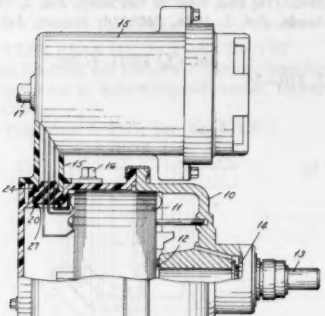
said body having a plurality of generally axial passages therein,

said unencased wires from said field winding having a diameter such that they can be readily inserted through said passages when said body is radially uncompressed,

said second housing having a cylindrical tubular wall having a uniform thickness and an internal diameter less than the maximum diameter of said frusto-conical portion of said body,

said tubular wall extending axially into the open end of said cavity and has a radial end surface,

said frusto-conical portion having a greater diameter at its base than the internal diameter of said tubular wall,



and mounting means for mounting said second housing on said first housing and drawing said housing toward one another to force said tubular wall axially into said cavity and against said body to compress said body when said second housing is in mounted position on said first housing thereby compressing the cylindrical portion of said body radially outwardly into tight conformity with the periphery of the cavity and radially inwardly into tight conformity with the unencased wires from the motor and thereby also compressing the frusto-conical portion radially outwardly against the interior said said tubular wall into tight conformity therewith and radially inwardly into tight conformity with said unencase wires,

the part of said frusto-conical portion of said body radially inwardly of said tubular wall being unrestrained axially at one end of said body,

the part of said cylindrical body radially inwardly of said opening in said cavity being unrestrained axially.

4,104,551

MEANS FOR COLLECTING MOISTURE IN CANNED ELECTRIC MOTORS

Wilhelm Blank, Speichersdorf, and Ernst Roth, Pegnitz, both of Fed. Rep. of Germany, assignors to Klein, Schanzlin & Becker AG, Frankenthal, Pfalz, Fed. Rep. of Germany

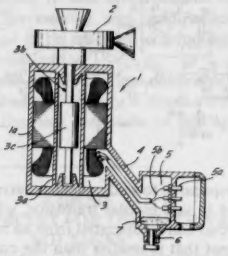
Filed Apr. 14, 1976, Ser. No. 676,701

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1975, 2516783

Int. Cl.[2] H02K *5/10, 5/22;* **B01D** *53/04*

U.S. Cl. 310—88 **8 Claims**

1. An explosion-proof canned electric motor for use at elevated temperatures, comprising a housing having a hollow upper portion and a hollow lower portion, said lower portion having a venting opening at the lowermost point thereof and said opening containing a porous hygroscopic desiccant body, said desiccant body absorbing moisture which is in the air flowing from the atmosphere into said housing via said open-



ing when the temperature in said housing decreases and from said housing into the atmosphere when the temperature in said housing increases, as well as any condensate which accumulates in said housing during operation of the motor and flows toward said opening.

4,104,552

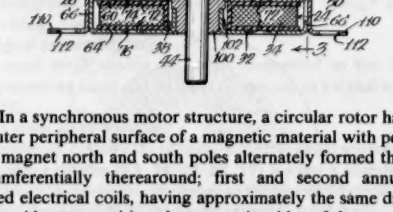
SYNCHRONOUS MOTOR STRUCTURE

Athanase N. Tsergas, Medinah, Ill., assignor to Merkle-Korff Gear Co., Des Plaines, Ill.

Filed Mar. 4, 1976, Ser. No. 664,034

Int. Cl.[2] H02K *21/14*

U.S. Cl. 310—156 **9 Claims**

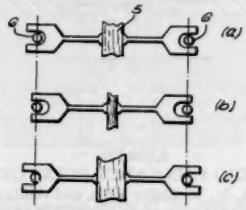


1. In a synchronous motor structure, a circular rotor having an outer peripheral surface of a magnetic material with permanent magnet north and south poles alternately formed therein circumferentially therearound; first and second annularly shaped electrical coils, having approximately the same diameter as said rotor, positioned on opposite sides of the rotor and coaxial therewith, each coil having a pair of inputs thereto for receiving an a.c. voltage for generating a field of magnetic flux; a first plurality of poles of a magnetic material in proximity with and extending circumferentially around the outer periphery of said rotor, with alternate ones of said poles magnetically coupled with a field of magnetic flux generated by said first coil on the side thereof toward said rotor, and with the remaining poles of said first plurality magnetically coupled with a field of magnetic flux generated by said coil on the opposite side thereof; and a second plurality of poles of a magnetic material in proximity with and extending circumferentially around the outer periphery of said rotor spaced from and aligned with said poles of said first polarity, with alternate ones of said poles of said second plurality magnetically coupled with a field of magnetic flux generated by said second coil on the side thereof toward said rotor, and with the remaining poles of said second plurality magnetically coupled with a field of magnetic flux generated by said coil on the opposite side thereof, said first and second plurality of poles extending across opposite peripheral halves of said rotor toward, but not across, the center of said periphery thereof.

4,104,553
FASTENING AND SUSPENSION ELEMENT FOR A PIEZOELECTRIC RESONATOR

Jean Engdahl, Bienne, and Huber Matthey, Brugg, both of Switzerland, assignors to Societe Suisse pour l'Industrie Horlogere (SSIH) Management Services S.A., Bienne, Switzerland

Filed Mar. 24, 1975, Ser. No. 561,309
Claims priority, application Switzerland, Mar. 29, 1974, 4401/74
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—352 **5 Claims**

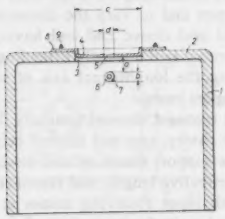


1. A suspension element for fastening a piezoelectric resonator to a support while isolating mechanical vibrations tending to be transmitted between the support and the resonator, said suspension element comprising a body having an active zone portion bounded on the ends thereof by two zone portions said two zone portions having cross sections substantially greater than that of said active zone portion, said active zone portion and said two end zone portions being formed from a single planar piece of material the cross sectional changes of which result entirely from changes of width, the distance separating said zone portions of greater cross section defining the free length of the element, said zone portions of greater cross section comprising two expansions for dampening said vibrations and for fastening the element to the resonator and to the support, respectively.

4,104,554
ELECTRON BEAM PRODUCING ARRANGEMENT FOR A CATHODE RAY TUBE

Rainer Kolbeck; Heinz Kuckenburg, both of Ulm, Donau, and Klaus Schaffernicht, Herrlingen, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Feb. 15, 1977, Ser. No. 768,707
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1976, 2606896; Feb. 20, 1976, 7605093[U]
Int. Cl.[2] H01J *29/02, 29/46*
U.S. Cl. 313—447 **11 Claims**

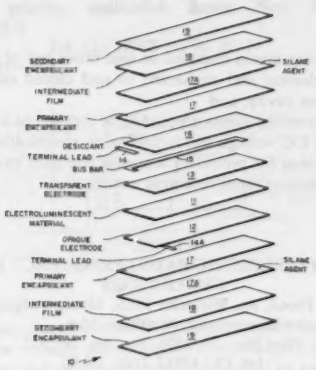


1. An electron beam producing arrangement for a cathode ray tube comprising a target electrode constructed like a fluorescent screen, said target electrode consisting of a vessel-shaped metallic control electrode having a wall thickness which is reduced in the region of the opening for passage of the beam and comprising a cathode arranged inside the control electrode and in front of the opening for passage of the beam, characterized in that said opening for passage of the beam is arranged in a hat-shaped drawn dish made of metal foil; that said dish is placed in a bore in the end wall of said control electrode with its substantially cylindrical part; that said dish is fixed at its edge to the outer surface of said end wall of said control electrode; and that said cathode has an electrically heatable cathode wire tensioned by at least one spring, with said wire being arranged at a spacing of 0.15 to 0.4 mm from the upper surface of said dish, below said opening for the passage of the beam and running substantially parallel to said end wall of said control electrode.

4,104,555
HIGH TEMPERATURE ENCAPSULATED ELECTROLUMINESCENT LAMP

Gordon R. Fleming, Hanover, N.H., assignor to Atkins & Merrill, Inc., Lebanon, N.H.

Filed Jan. 27, 1977, Ser. No. 762,853
Int. Cl.[2] H05B *33/04*
U.S. Cl. 313—512 **19 Claims**



1. An electroluminescent lamp comprising
a layer of electroluminescent material disposed between a pair of electrodes, at least one of said electrodes being capable of transmitting light emitted by the electroluminescent material therethrough;
at least one layer of a primary encapsulant material encasing at least one of said pair of electrodes;
at least one layer of substantially transparent polymeric film material encasing said at least one layer of primary encapsulant material; and
at least one layer of a secondary encapsulant material encasing said at least one layer of polymeric film material.

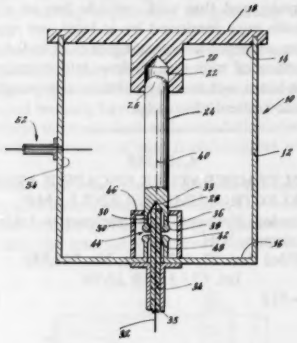
4,104,556
HIGH ENERGY RADIO FREQUENCY PULSE GENERATORS

Joseph M. Proud, Jr., Wellesley Hills, and Charles N. Fallier, Jr., Westford, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 15, 1976, Ser. No. 741,926
Int. Cl.[2] H01J *7/46, 19/80*
U.S. Cl. 315—39 **8 Claims**

1. A radio frequency generator for providing high energy pulses comprising in combination:
a. an elongated resonant cavity having an open end and an essentially closed end;
b. insulator means adapted to cooperate with said cavity open end and having an inwardly extending portion, said inwardly extending portion being provided with support means;

c. an elongated resonant element centrally disposed within said resonant cavity, one end thereof being disposed within said insulator support means, said resonant element being provided with input receiving means at its other end proximate the longitudinal axis thereof;



d. switching means disposed on said other end of said resonant element and connected to said closed end of said resonant cavity; and

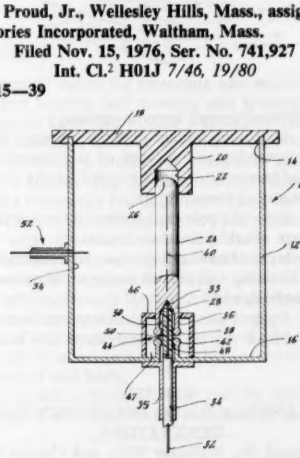
e. input terminal means adapted to be coupled to a source of pulsed DC voltage and including an electrically conductive means for providing a conductive path to said resonant element input receiving means.

4,104,557

LIQUID DIELECTRIC RADIO FREQUENCY PULSE GENERATORS

Joseph M. Proud, Jr., Wellesley Hills, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 15, 1976, Ser. No. 741,927
Int. Cl.[2] H01J *7/46, 19/80*
U.S. Cl. 315—39 **12 Claims**



1. A liquid dielectric radio frequency generator for providing high energy pulses comprising in combination:

a. an elongated resonant cavity having an open end and an essentially closed end;

b. insulator means adapted to cooperate with said cavity open end and having an inwardly extending portion, said inwardly extending portion being provided with support means;

c. an elongated resonant element centrally disposed within said resonant cavity, one end thereof being disposed within said insulator support means, said resonant element being provided with input receiving means at its other end proximate the longitudinal axis thereof;

d. switching means disposed on said other end of said resonant element and connected to said closed end of said resonant cavity;

e. housing means for enclosing said switching means;

f. a liquid disposed within said housing means; and

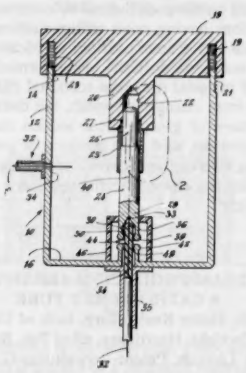
g. input terminal means adapted to be coupled to a source of pulsed voltage and including an electrically conductive means for providing a conductive path to said resonant element input receiving means.

4,104,558

TUNABLE RADIO FREQUENCY PULSE GENERATORS

Joseph M. Proud, Jr., Wellesley Hills, and William H. McNeill, Carlisle, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 15, 1976, Ser. No. 741,928
Int. Cl.[2] H01J *7/46, 19/80*
U.S. Cl. 315—39 **5 Claims**



1. A tunable radio frequency generator for providing high energy pulses comprising in combination:

a. an elongated resonant cavity having an open end and an essentially closed end;

b. insulator means for varying the resonant frequency of said generator, said means adapted to movably cooperate with said cavity open end to vary the distance between said open end and said closed end and having an inwardly extending portion, said inwardly extending portion being movable along the longitudinal axis of said cavity and including support means;

c. an elongated resonant element centrally disposed within said resonant cavity, one end thereof being slidably received by the support means of said insulator means for changing its effective length, said resonant element being provided with input receiving means at its other end proximate the longitudinal axis thereof;

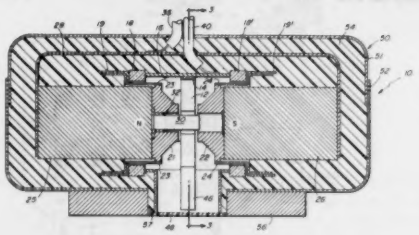
d. switching means disposed on said other end of said resonant element and connected to said closed end of said resonant cavity; and

e. input terminal means adapted to be coupled to a source of pulsed DC voltage and including an electrically conductive means for providing a conductive path to said resonant element input receiving means.

4,104,559
ISOPOLAR MAGNETRON SUPPORTED WITH RIGID INSULATION IN A REMOTE HOUSING

David Hobbs, Belmont, Mass., assignor to Microwave Associates, Inc., Burlington, Mass.

Filed Nov. 1, 1976, Ser. No. 737,076
Int. Cl.[2] H01J 25/50
U.S. Cl. 315—39.51 11 Claims

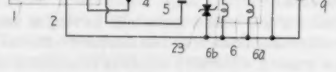


1. In a microwave magnetron of the type having a cavity-resonator anode, a cathode space, a cathode in the cathode space, and means to furnish magnetic flux in the cathode space for magnetron operation, an assembly of an anode structure comprising a generally tubular anode support having first and second ends and said cavity-resonator anode supported from said tubular anode support between said ends, output means for said magnetron coupled to said anode, a magnetic flux providing structure comprising magnetic pole pieces insulated from said anode structure for providing said magnetic flux, said cathode means extending between said pole pieces in said cathode space, a housing surrounding and spaced from said anode structure, said flux producing structure and said cathode means, and solid insulator material filling the space between said housing and said structures for rigidly supporting the same within said housing, said housing having an access passage for coupling to said output means, a first electrical connector passing through said housing and said filling material to said anode structure, and a second electrical connector passing through said housing and said filling material for connection to said cathode means.

4,104,560
LIGHTING SYSTEM FOR A MOTOR VEHICLE

Tetsuo Kato, Anjo, and Kazumasa Mori, Aichi, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 603,502, Aug. 11, 1975, abandoned.
This application Feb. 24, 1977, Ser. No. 771,471
Claims priority, application Japan, Aug. 21, 1974, 49/96312
Int. Cl.[2] B60Q 1/02
U.S. Cl. 315—83 3 Claims



1. A lighting system for a motor vehicle of the type having a magneto-generator rotated by an engine of said vehicle to develop alternating voltages from separate first and second windings, said first winding being associated with circuit means for charging a battery,

the system comprising:

lighting means including a main lamp and an auxiliary lamp;

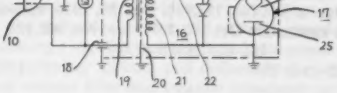
a first switching means for connecting the lighting means across the second winding whereby the main lamp is normally conducting;

a second switching means including: (1) a contact switch which is arranged in series with the auxiliary lamp, the series arrangement being connected across the main lamp; and (2) a bidirectional voltage sensing means connected across said main lamp, said sensing means being responsive to a rise in alternating voltage above a predetermined value, in both positive and negative directions, resulting from interruption of the conduction of said main lamp, thereby actuate said contact switch and energize the auxiliary lamp.

4,104,561
MAGNETRON OPERATING CIRCUIT

Kozo Iwata, Kyoto, Japan, assignor to New Nippon Electric Co., Ltd., Osaka, Japan

Filed Nov. 22, 1976, Ser. No. 743,649
Claims priority, application Japan, Nov. 28, 1975, 50/162523[U]
Int. Cl.[2] H05B 39/00, 41/14
U.S. Cl. 315—101 5 Claims



1. An operating circuit for energizing a magnetron tube from an a.c. low voltage power source comprising a microwave generator including a magnetron tube having an anode and a cathode, a high voltage transformer having a primary winding and conductor wires connecting said primary winding to said a.c. power source and a secondary winding connected to said magnetron, a rectifier coupled to said magnetron tube and poled oppositely to said magnetron so as to allow the flow of current through the magnetron tube for alternate half-cycles of said a.c. power source, a filter including a pair of feed-through capacitors and a choke coil, and means for shielding said high voltage transformer, said rectifier and said filter by a metal shield housing to suppress undesired radiation, one of said feed-through capacitors of said filter being operatively connected to each of said conductor wires which connect said primary transformer winding to said low voltage power source, each of said feed-through capacitors having a relatively large capacitance, for example, at least about 1000pF.

4,104,562
TRAFFIC LIGHT DIMMER SYSTEM

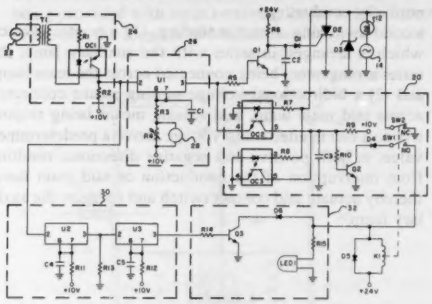
Joseph A. DiCola, Willingboro, N.J., assignor to Traffic Systems, Inc., Brentwood, N.Y.

Filed Nov. 17, 1976, Ser. No. 742,582
Int. Cl.[2] H05B 41/392, 39/04
U.S. Cl. 315—158 10 Claims

1. In a dimmer circuit including a unilateral conducting means adapted to be placed in series with a light means for decreasing the power provided by an A.C. source of voltage to said light means, the improvement comprising:

means for sensing the forward voltage across said unilateral conducting means,

and means responsive to said sensing means for overriding said unilateral conducting means for providing full power



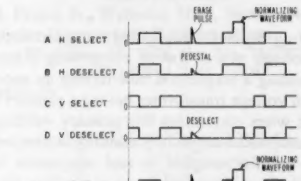
to said light means upon failure of said unilateral conducting means.

4,104,563

WRITING AND ERASING IN AC PLASMA DISPLAYS

Eugene Stewart Schlig, Somers, and George Raymond Stilwell, Jr., West Nyack, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 755,894, Dec. 30, 1976, abandoned.
This application Oct. 25, 1977, Ser. No. 845,100
Int. Cl.[2] H05B *41/14*
U.S. Cl. 315—169 TV **15 Claims**



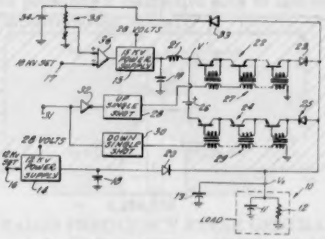
1. A method of reducing error in the addressing operations of an AC gas discharge display panel via normalizing the state of addressed cells by applying a voltage complex to addressed cells during the erase and/or write cycle therefor, said voltage complex including at least a first component of at least one voltage level having a magnitude approximately equal to that of the magnitude of the sustain voltage level V_s for said display panel, at least a second component of at least one voltage level having a polarity the same as the polarity of said at least one voltage level of said first component and a magnitude approximately equal to twice that of the sustain voltage level V_s, and at least a third component of at least one voltage level approximately equal to zero volts.

4,104,564

HIGH SWITCHING SPEED HIGH VOLTAGE POWER SUPPLY

David A. Cohen, Hauppauge, and Charles Lien, Huntington, both of N.Y., assignors to Venus Scientific Inc., Farmingdale, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,402
Int. Cl.[2] H01J *29/80*
U.S. Cl. 315—171 **16 Claims**



1. A high voltage power supply for supplying at least first and second high voltage outputs to a capacitive load; said power supply comprising first and second voltage sources having different high voltage outputs, an inductive means, first and second high speed switching means and first and second diodes connected in series with said first and second high speed switching means; said series-connected first switching means and first diode being connected in parallel with said series-connected second switching means and second diode; said first and second diodes being poled in opposite directions; and first and second high speed switch operating means operable for closing said first and second switching means respectively in order to switch said power supply output between said first and second voltage outputs; said first voltage source being connected directly to said capacitive load; said second voltage source being connected in series with said inductive means and said capacitive load, and in series with said parallel connection of said first and second high speed switching means and said respective first and second diodes respectively; said inductive means being resonant which said capacitive load at a given frequency, whereby the switching speed of said supply is about one-half the period of said given frequency.

4,104,565

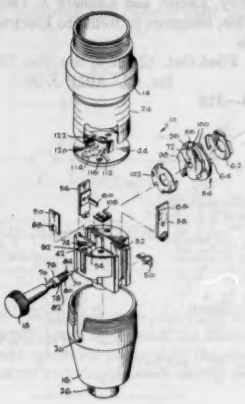
LAMP SOCKET FOR USE WITH MULTI-LEVEL BULB AND NIGHTLIGHT

Fritz E. Klassen, 4860 McKinnon Dr., Anaheim, Calif. 92807

Filed May 20, 1977, Ser. No. 798,756
Int. Cl.[2] H05B *35/00*; H01R *19/54*
U.S. Cl. 315—178 **10 Claims**

1. A socket for use with a main bulb having at least two different levels of illumination and an auxiliary bulb, the socket comprising a housing, a plurality of power terminals within the housing adapted to be coupled to a source of power, a plurality of main terminals within the housing adapted to be coupled to a main bulb having at least two different levels of illumination, at least one auxiliary terminal within the housing adapted to be coupled to an auxiliary bulb, and manually actuable means coupled to the power terminals, the main terminals and the at least one auxiliary terminal and operative to couple the power terminals to different combinations of the main terminals, the

at least one auxiliary terminal, and both the main terminals and the at least one auxiliary terminal as the manually actuable



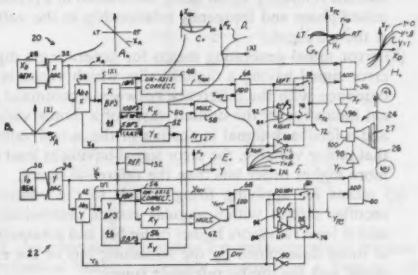
means is manually advanced through a plurality of different positions.

4,104,566

ANALOG CORRECTION SYSTEM

Naren Chimanlal Shah, Indian Harbor Beach, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Apr. 29, 1976, Ser. No. 681,588
Int. Cl.[2] H01J *29/56*
U.S. Cl. 315—371 **10 Claims**



1. Apparatus for compensating for nonlinear deflection characteristics of a display system for displaying graphical images on an energy responsive surface with a radiant energy beam and having deflection means responsive to at least one deflection signal for controlling deflection of said beam, said nonlinear deflection characteristic being such that the amount of deflection error due to said nonlinearity is a function of the amount of deflection of said beam on said energy responsive surface and is greatest at the extremes of said deflection, said apparatus comprising:

means for providing a deflection signal linearly responsive to an input signal, and for scaling said deflection signal such that a deflection signal corresponding to an input signal indicative of maximum deflection will cause said deflection means to produce said maximum deflection substantially without compensation;

compensation means for generating a compensation signal having a non-monotonic functional relationship to said deflection signal, said functional relationship being selected so that said compensation signal, when additively combined with said deflection signal, will compensate said deflection signal for said nonlinear deflection characteristic of said display system; and

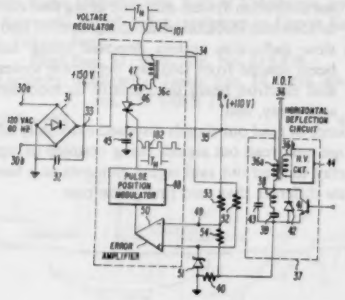
means for additively combining said compensation signal and said deflection signal so as to provide a compensated said deflection signal for application to said deflection means.

4,104,567

TELEVISION RASTER WIDTH REGULATION CIRCUIT

John Charles Peer, and David Warren Luz, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 24, 1977, Ser. No. 762,097
Int. Cl.[2] H01J *29/70, 29/72*
U.S. Cl. 315—387 **19 Claims**



1. A raster width regulation circuit, comprising:

a deflection circuit;

a variable impedance means responsive to a source of unregulated voltage for providing a first direct current voltage to said deflection circuit, said variable impedance means including a variable reactive impedance means coupled to said deflection circuit, said deflection circuit drawing a load current from said variable impedance means which tends to decrease the magnitude of said first direct current voltage; and

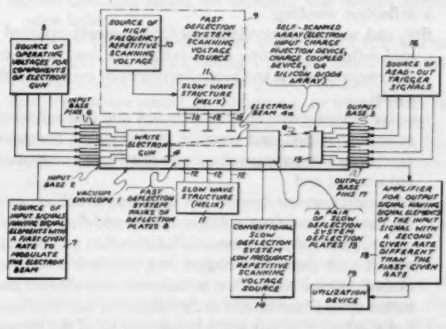
first feedback means coupled to said variable impedance means and responsive to said load current for providing a first feedback voltage for increasing the magnitude of said reactive impedance means as said load current increases for further decreasing the magnitude of said first direct current voltage for maintaining a substantially constant raster width.

4,104,568

SCAN-CONVERTER TUBE SYSTEM

Charles Bruce Johnson, Fort Wayne, Ind., assignor to International Telephone & Telegraph Corporation, Nutley, N.J.

Filed Sep. 27, 1976, Ser. No. 726,894
Int. Cl.[2] H01J *29/70, 29/72*
U.S. Cl. 315—394 **15 Claims**


SOURCE OF OPERATING VOLTAGES FOR COMPONENTS OF ELECTRON GUN
SOURCE OF HIGH FREQUENCY REPETITIVE SCANNING VOLTAGE
FAST DEFLECTION SYSTEM REPETITIVE SCANNING VOLTAGE SOURCE
SELF-SCANNED ARRAY (ELECTRON INPUT CHARGE INJECTION DEVICE, CHARGE COUPLED DEVICE, OR SILICON DIODE ARRAY)
SOURCE OF AERA-OUT TRIGGER SIGNALS
SLOW WAVE STRUCTURE (HELIX)
WRITE ELECTRON GUN
ELECTRON BEAM
SOURCE OF INPUT SIGNALS HAVING SIGNAL ELEMENTS WITH A FIRST GIVEN RATE TO MODULATE THE ELECTRON BEAM
VACUUM ENVELOPE
FAST DEFLECTION SYSTEM PAIR OF DEFLECTION PLATES
SLOW WAVE STRUCTURE (HELIX)
CONVENTIONAL SLOW DEFLECTION SYSTEM LOW FREQUENCY REPETITIVE SCANNING VOLTAGE SOURCE
A PAIR OF SLOW DEFLECTION SYSTEM DEFLECTION PLATES
AMPLIFIER FOR OUTPUT SIGNAL HAVING SIGNAL ELEMENTS OF THE INPUT SIGNAL WITH A SECOND GIVEN RATE DIFFERENT THAN THE FIRST GIVEN RATE
UTILIZATION DEVICE

1. A scan-converter tube system comprising:

a write electron gun disposed at one end of a vacuum envelope to produce an electron beam modulated by an external input signal having signal elements occurring at a first given rate;

a self-scanned matrix array disposed at the other end of said envelope;

an electron beam deflection system disposed in said envelope between said electron gun and said array to scan said electron beam over said array to store said signal elements in said array, said array providing amplification of said stored signal elements;

said deflection system including

a fast deflection system disposed along said electron beam to scan said electron beam along lines of said array, and

a slow deflection system disposed along said electron beam spaced from said fast deflection system to move said electron beam sequentially to successive lines of said array, and

a source of read out signals disposed externally of said envelope, said read out signals being coupled as inputs to said array to read out said signal elements at a second given rate different than said first given rate.

4,104,569

HORIZONTAL DEFLECTION CIRCUIT WITH AUXILIARY POWER SUPPLY

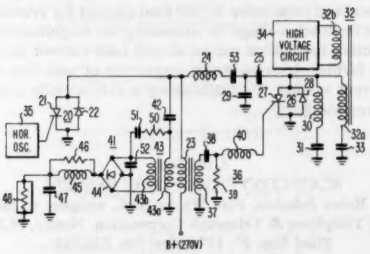
Gerhard Förster, Würenlos, and Walter Bohringer, Schlieren, both of Switzerland, assignors to RCA Corporation, New York, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,216

Claims priority, application United Kingdom, Apr. 26, 1976, 16868/76

Int. Cl.² H01J *29/70, 29/76*

U.S. Cl. 315—408 **7 Claims**



1. A deflection circuit for a television receiver comprising:

a deflection winding;

first and second controllable switching means coupled to said deflection winding and arranged for conducting during respective first and second portions of each deflection cycle;

reactive circuit means coupled between said first and second switching means, said reactive circuit means comprising an energy storage capacitance coupled to a commutating inductance; and

first damping means coupled to said first switching means for damping transient voltages across said first switching means, said damping means including a first inductance to which said transient voltages are coupled; and a load circuit coupled to said first inductance, the reflected impedance of said load circuit as developed by said first inductance selected to provide substantially all of the transient voltage damping across said first switching means.

4,104,570

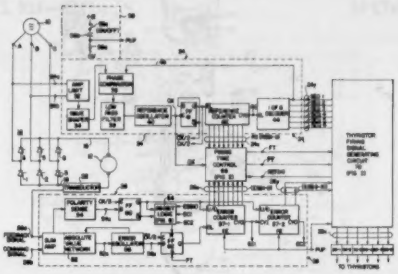
DIGITAL CONTROL SYSTEM FOR MOTORS

Russell Hamby, Euclid, and Kenneth A. Ostrander, Columbus, both of Ohio, assignors to Reliance Electric Company, Cleveland, Ohio

Filed Oct. 12, 1976, Ser. No. 731,642

Int. Cl.² A02P *5/06*

U.S. Cl. 318—318 **36 Claims**



1. A digital d-c motor control circuit comprising:

an a-c input for connection to an a-c source,

a d-c output for connection to a motor,

a controlled rectifier circuit for controlling the flow of power between the a-c input and the d-c output,

a firing control circuit for applying firing signals to the controlled rectifier circuit to control the magnitude and direction of power flow therethrough, said firing control circuit including:

(a) reference signal generating means for generating a periodic digital reference signal having at least eight bits, the reference signal being maintained in a predetermined phase and frequency relationship to the voltage at the a-c input,

(b) error signal generating means for generating a digital error signal having a digital value which varies in accordance with the difference between a command signal indicative of the desired value of a motor variable and a feedback signal indicative of the actual value of that motor variable, the error signal having at least two more higher order bits than the reference signal,

(c) means for applying firing signals to the controlled rectifier circuit within angular ranges determined by said at least two more higher order bits and substantially at times determined by the remaining bits of the error signal and the digital reference signal,

whereby the digital control circuit may control the operation of a motor over both the monitoring and inverting ranges thereof.

4,104,571

PULSE CONTROLLERS

David Gurwicz, and Albert Everett Sloan, both of Gateshead, England, assignors to Sevcon Limited, Gateshead, England

Filed Nov. 16, 1976, Ser. No. 742,227

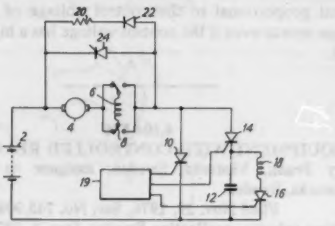
Claims priority, application United Kingdom, Nov. 18, 1975, 47483/75

Int. Cl.² H02P *3/12*

U.S. Cl. 318—380 **16 Claims**

1. A pulse controller for controlling the current supply to a reversible d.c. series motor, comprising semiconductor switching means for connection in series with the d.c. motor and a d.c. supply and adapted repetitively to connect the motor to and disconnect the motor from the d.c. supply, a unidirectional current path connected in use across the motor armature and field windings so that motor current can circulate in the loop including the armature, field windings and current path during interpulse periods when the motor is disconnected from the d.c. supply by the semiconductor switching means, the unidirectional current path containing impedance such that when

the motor is in the plugging mode the current circulating through the said loop decays during the said interpulse periods, a switch means arranged on actuation thereof to short out the impedance in the unidirectional current path, actuating means



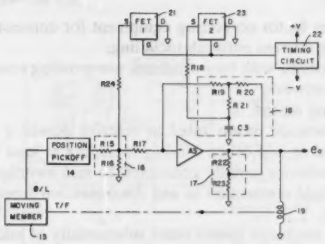
for actuating the switch means to short out the impedance during interpulse periods at least when the motor is not in the plugging mode, and means for controlling the mark-space ratio of the semiconductor switching means during plugging.

4,104,572

SERVO SYSTEM TEMPORARY DESTABILIZATION CIRCUIT AND METHOD

Richard A. Hanson, Concord, Calif., assignor to Systron-Donner Corporation, Concord, Calif.

Filed Apr. 25, 1977, Ser. No. 790,475
Int. Cl.[2] G05B *11/01*
U.S. Cl. 318—631 **11 Claims**



1. An electrical apparatus for reducing static friction in a mechanical bearing assembly disposed in a housing, which supports a moving member for rotational movement about a pivot axis extending through the mechanical bearing assembly, comprising

means for urging said moving member toward a reference position about the pivot axis,

a position pickoff for providing a position signal indicative of the rotational position of the moving member relative to said reference position,

an amplifier coupled between said position pickoff and said means for urging and having an output and an input, said means for urging, position pickoff, and amplifier thereby forming a servo loop,

a feedback circuit coupled between said amplifier output and input,

means for damping said servo loop disposed in said feedback circuit,

an input divider coupled between said position pickoff and said amplifier input operating to attenuate the input to said amplifier when one leg of said divider is shunted,

a first field effect transistor connected to shunt said means for damping when conducting,

a second field effect transistor connected to shunt said one leg of said input divider so that the gain of said loop is attenuated,

and a timing circuit for enabling said first and second field effect transistors to conduct for a predetermined period of time,

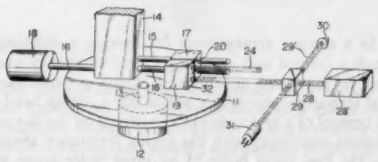
so that when said first and second field effect transistors are enabled by said timing circuit phase lag through said servo loop is increased to more than 180°, thereby producing instability in said servo loop and a substantially symmetrical oscillatory motion of the moving member about said reference position.

4,104,573

SPEED CONTROL DEVICE FOR A MOVING MEMBER

Takeshi Goshima, Tokyo; Yoshinori Suglura, Kawasaki; Kiyonobu Endo; Hideaki Sato, both of Yokohama, and Kimio Kono, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1975, Ser. No. 612,478
Claims priority, application Japan, Sep. 14, 1974, 49-106343
Int. Cl.[2] G05B *1/06*
U.S. Cl. 318—640 **6 Claims**



1. An optical head moving apparatus comprising:

a movable base stand (17);

first driving means (18) for moving said movable base stand in predetermined direction at a constant speed;

an optical head (19) to be moved at a constant speed, said optical head having an optical system for projecting a light beam, and light reflecting means;

coupling means (20) coupling said optical head with said movable base stand such that said optical head is movable with respect to said movable base stand while said first driving means is operative to move said movable base stand;

a first position coherent light obtained by irradiation onto said reflection means of a laser beam from a laser beam generator fixedly disposed at a predetermined position;

a second position coherent light obtained by irradiation onto said reflecting of a laser beam from said laser beam generator, said second position coherent light being different in phase from said first position coherent light;

a reference coherent light;

means for forming first and second interference lights by combination of said first and second coherent lights, and said reference coherent light;

first detecting means for detecting said first interference light;

second detecting means for detecting said second interference light;

means for producing sinusoidal waveform of first and second reference signals having a predetermined frequency, resspectively, but different in phase from each other;

first comparison means for comparing the output from said first detecting means with said first reference signal;

second comparison means for comparing the output from said second detecting means with said second reference signal;

means for alternately selecting the output from said first comparison means and the output from said second comparison means in accordance with their amplitude; and

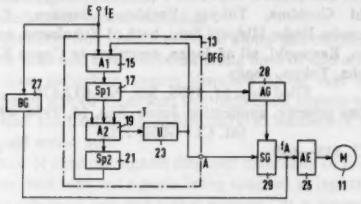
means for applying an output from said selecting means to said second driving means to control same such that the outputs from said first and second detecting means coincide with said first and second reference signals, respectively.

4,104,574

STEPPING MOTOR CONTROL ARRANGEMENT

Ulrich Schäff, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 560,403, Mar. 20, 1975, abandoned.
This application Mar. 25, 1977, Ser. No. 781,432
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1974, 2414627
Int. Cl.² H02K *37/00*
U.S. Cl. 318—696 **2 Claims**



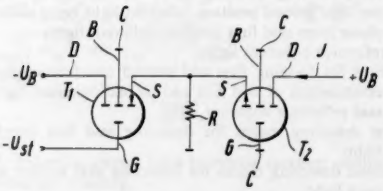
1. In a control arrangement for driving a stepping motor through a control unit including digital frequency smoothing means, an improved arrangement which permits using such digital frequency smoothing means for a typing head or carriage control of a motor driven typewriter or the like comprising means associated with the digital frequency smoother to cause the first input pulse of an input pulse series supplied thereto to also be supplied directly to the output of the digital frequency smoother and means to suppress the last output pulse from the digital frequency smoother.

4,104,575

CONSTANT CURRENT SEMICONDUCTOR CIRCUIT ARRANGEMENT

Hubert Bauer, Holzkirchen, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 28, 1977, Ser. No. 782,231
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1976, 2615848
Int. Cl.² G05F *3/08*; H02J *1/04*
U.S. Cl. 323—4 **7 Claims**



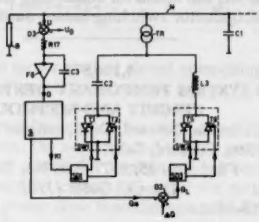
1. A constant current circuit arrangement comprising a pair of enhancement type MOSFETs having opposite conductivities relative to each other and including a first input transistor and a second output transistor, each transistor having a source terminal, a gate terminal, a substrate terminal, and a drain terminal, said gate terminal of said first input transistor providing a control input, a control voltage source having a polarity corresponding to the conductivity type of said first input transistor and being connected to said gate terminal of said first input transistor, said drain terminal of said second transistor providing a constant current output, first means interconnecting said source terminals to each other, resistor means connecting said interconnected source terminals to ground, second means connecting said substrate terminals of both transistors and the gate terminal of the second output transistor to ground, an operating voltage source connected to the drain terminals of both transistors in such a manner that the polarities of the operating voltage source correspond to the respective conductivity type of said first and second transistors, whereby said drain current of said second transistor constitutes a constant current proportional to the control voltage of said control voltage source even if the control voltage has a high switching speed.

4,104,576

EQUIPMENT WITH CONTROLLED REACTANCE

Harry Frank, Västerås, Sweden, assignor to ASEA AB, Västerås, Sweden

Filed Nov. 29, 1976, Ser. No. 745,906
Claims priority, application Sweden, Dec. 1, 1975, 7513475
Int. Cl.² H02J *3/18*
U.S. Cl. 323—102 **7 Claims**



1. Power factor correcting equipment for connection to an alternating current network including:

a transformer with two windings, one winding connected to said network,

switching means,

first reactance means rated at reactive power *q* and connected to said other winding including at least one reactance device serially connected to said switching means for rapid connection to and disconnection from said network,

second reactance means rated substantially at said reactive power *q* and also connected to said other winding including at least one inductor and a control means for continuous control of the reactance of said at least one inductor, and

second control means responsive to a signal determinative of necessary reactive power for controlling said switching means, for step-wise varying the reactance provided by said first reactance means, and for controlling said control means for continuous control of the reactance contributed by said second reactance means, to provide for overall continuous control of reactance as a function of said signal.

4,104,577

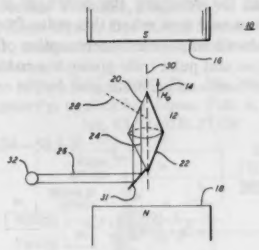
MAGNETIC RESONANCE APPARATUS

Ivan Anderson Greenwood, Stamford, Conn., assignor to The Singer Company, Little Falls, N.J.

Filed Feb. 2, 1977, Ser. No. 765,135
Int. Cl.² G01R *33/08*
U.S. Cl. 324—0.5 F **18 Claims**

1. In a magnetic resonance apparatus having an alignment axis which is located in and oriented parallel to a unidirectional magnetic field when the apparatus is in operation and an absorption cell intersected by the alignment axis having a plurality of surface elements, each of said plurality of surface elements having a normal, surrounding a hollow cell interior in

which a magnetic resonance medium is located, the improvement comprising: the absorption cell having surface elements



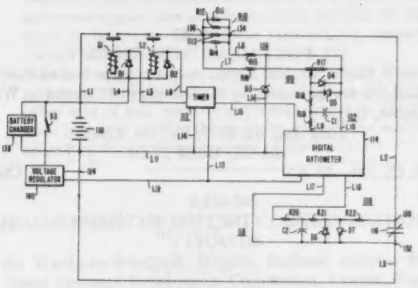
the normals of which simultaneously form angles of around 55° with lines parallel to the alignment axis.

4,104,578

PORTABLE DIGITAL OHMMETER

Michael E. Thuot, Espanola, N. Mex., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 10, 1976, Ser. No. 740,686
Int. Cl.² G01R 31/02
U.S. Cl. 324—28 CR **10 Claims**



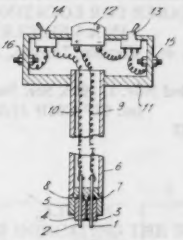
1. A portable ohmmeter useful in measuring the resistance of an electrically conducting member comprising:
- a direct current power source;
- a resistive element serially connected to said power source, said resistive element having a resistance greater than the resistance of said conducting member to be measured;
- means for connecting said conducting member in series with said power source and said resistive element to thereby complete a circuit;
- means for sensing the voltage drop across said resistive element;
- means for sensing the voltage drop across said conducting member;
- a digital ratiometer having inputs connected to said conducting member sensing means and said resistive element sensing means, said ratiometer comparing said conductive member voltage drop to said resistive element voltage drop, said ratiometer digitally displaying the ratio of said conducting member voltage drop to said resistive element voltage drop; and
- calibration means for calibrating said ratiometer as a function of the resistance of said resistive element.

4,104,579

METHOD OF EXAMINATION OF PROTECTIVE COATINGS

Malcolm Charles McIvor, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 15, 1976, Ser. No. 666,933
Claims priority, application United Kingdom, Mar. 27, 1975, 12872/75
Int. Cl.² G01N 27/42
U.S. Cl. 324—29 **13 Claims**



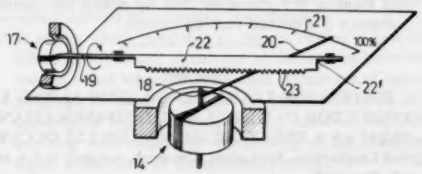
1. A method for detecting the presence of a failure in a protective coating on the interior surface of a metal vessel which comprises causing an electrolyte to make contact with the protective coating, and making comparison of the electric current generated through the electrolyte
- (a) between the metal vessel and a reference-electrode immersed in the electrolyte, and
- (b) between the same reference electrode and a simulation-electrode immersed in the electrolyte and having a working surface of the same metal as that of the metal vessel said reference electrode and simulation-electrode simultaneously contacting said electrolyte.

4,104,580

STORAGE BATTERY TEST APPARATUS TO DETERMINE REMAINING STORED CHARGE THEREIN

Josef Juhasz, Möglinegen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Sep. 28, 1976, Ser. No. 727,951
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1975, 2545086
Int. Cl.² G01N 27/42
U.S. Cl. 324—29.5 **7 Claims**



1. Storage battery test apparatus to determine the remaining storage capacity of the battery (10) comprising
- a volt meter (14) having a needle (20) and voltage connection means to connect said volt meter across the battery terminals (12, 13);
- a standard load (11) and power connection means (15) to connect the standard load across the battery terminals (12, 13);
- a current sensing means (16, 17) including an ammeter (17) and current connection means to connect the current sensing means into the power connection means and hence into the battery — standard load circuit,
- and a meter arresting device (22, 22', 23) mechanically coupled to the volt meter (14) and controlled by the ammeter

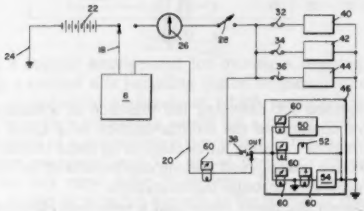
to arrest movement of the volt meter needle (20) under current sensing conditions of current flow other than current flow at a predetermined test current range, the ammeter sensing when a predetermined current flows from the battery (10) to the standard load, and controlling the volt meter to then provide an output indication which will be representative of the remaining charge stored in the battery.

4,104,581

METHOD UTILIZING AN AUTOMATIC RESETTABLE CIRCUIT BREAKER FOR LOCATING GROUND FAULTS IN A VEHICLE

Steven Arkosy, 463 Elevado Terrace, Monterey Park, Calif. 91754

Filed Nov. 1, 1976, Ser. No. 737,603
Int. Cl.[2] G01R *31/08*
U.S. Cl. 324—52 **1 Claim**



1. A method for locating a grounded fault in a vehicle having a plurality of protected electrical circuits energized by a battery comprising the steps of,

first disconnecting the battery hot terminal leaving only the grounded terminal of the battery connected,

connecting an automatic resettable circuit breaker across the free hot terminal of the battery and the load side of each of the pluarlity of protected circuits under test individually one by one,

selecting a protected circuit under test showing evidence of sparking when connecting the circuit breaker while maintaining the connection of the circuit breaker across the hot terminal and the load side of the protected circuit under test showing evidence of sparking,

then moving an induction current measuring ammeter over the selected protected circuit under test showing evidence of sparking without disturbing said circuit and detecting a varying current, and

then locating the grounded fault by noting the immediate absence of detected varying current.

4,104,582

SYSTEM FOR LOCALIZING A SPOT ALONG A CONDUCTOR IN WHICH AN IMPEDANCE CHANGE SUCH AS A BREAK OR SHORT CIRCUIT OCCURS

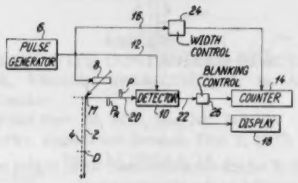
Ejvind Lambertsen, Fredericia, Denmark, assignor to i. c. moller a/s, Denmark

Filed Dec. 20, 1976, Ser. No. 752,192
Claims priority, application United Kingdom, Dec. 24, 1975, 52789/75
Int. Cl.[2] G01R *31/11*
U.S. Cl. 324—52 **12 Claims**

6. A system for localizing a spot along an electric conductor in which an impedance change such as a break or a short circuit has taken place, comprising:

pulse generator means for transmitting a series of electric pulse trains to the conductor from one end thereof, each of said pulse trains comprising a series of pulses of individual widths ranging between a minimum width corresponding to the pulse running to and back again from a conductor point relatively close to said conductor end and a maximum width corresponding to the pulse running to and back again from at least a point near the opposite end of the conductor length to be supervised;

detector means for detecting the return of a pulse front reflected from said spot when this pulse front reception coincides substantially with the termination of the individual pulse from said pulse train giving rise to the reflection of said pulse front and generating an output response; and



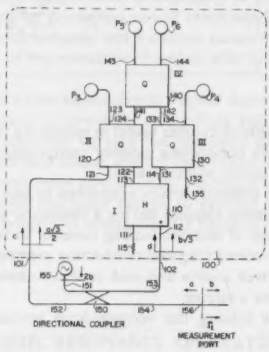
pulse identification means connected to said pulse generator means and said detector means for producing information selectively indicative of the single individual pulses of each of said pulse trains, said pulse identification means producing information identifying the pulse giving rise to said detector response in accordance with a signal from said detector means so that the time interval between the transmission and the reception of the reflected pulse may be determined and the position of said spot from which said pulse was reflected may be located.

4,104,583

SIX-PORT MEASURING CIRCUIT

Glenn F. Engen, Boulder, Colo., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Aug. 31, 1977, Ser. No. 829,381
Int. Cl.[2] G01R *27/04*
U.S. Cl. 324—58 A **21 Claims**



17. A six-port measuring network comprising:

first, second, third, and fourth hybrid means;

an input port connected to said first hybrid means;

a second input port connected to said second hybrid means;

a first measuring port connected to said second hybrid means;

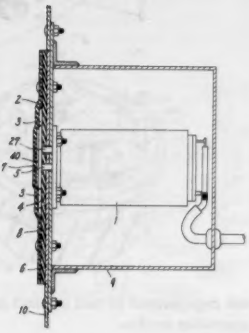
a second measuring port connected to said third hybrid means; and

third and fourth measuring ports connected to separate terminals of said fourth hybrid means.

4,104,584
MOISTURE CONTENT METER

Yukio Miyai, Osaka; Takeshi Kojo; Junichi Takahashi, both of Kyoto; Satoshi Yoshioka, Nagaokakyo; Kensuke Nakamichi, Ibaraki; Kozo Okada, Osaka, and Setsuko Takeda, Muko, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 2, 1977, Ser. No. 764,864
Claims priority, application Japan, Feb. 6, 1976, 51-12530
Int. Cl.[2] G01R *27/04*
U.S. Cl. 324—58.5 R 4 Claims

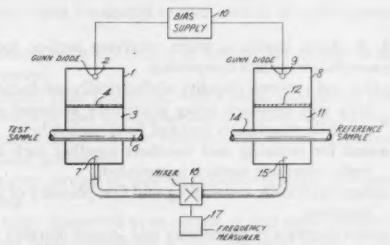


1. A moisture content meter comprising
a microwave generator for generating a microwave signal of a constant power level,
a microstrip transmission line connected in a manner to receive at one end thereof the microwave signal from said microwave generator and disposed on one side of a sample body to be measured so as to substantially contact the surface thereof and
a microwave detector connected in a manner to detect the power level of the microwave signal taken out from the other end of said microstrip transmission line, the difference in power lines at the opposite ends of the microstrip reflecting the moisture content of the body.

4,104,585
MEASUREMENT OF IMPURITY CONCENTRATION IN LIQUIDS

John Wardman Schofield, Hitchin, England, assignor to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 590,822, Jun. 26, 1975, abandoned. This application Jan. 26, 1977, Ser. No. 762,923
Claims priority, application United Kingdom, Dec. 23, 1974, 55455/74
Int. Cl.[2] G01R *27/04*
U.S. Cl. 324—58.5 C 5 Claims

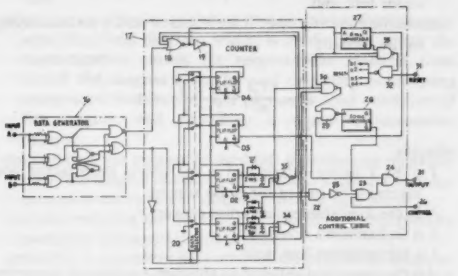


1. Apparatus for the measurement of the concentration of impurities in liquids comprising two microwave cavity resonators, two microwave generators each coupled to a respective cavity resonator, means for enabling a standard sample of liquid to be coupled to one of the resonators to affect the resonant frequency thereof, means for enabling a sample of liquid under test to be coupled to the other resonator to affect the resonant frequency thereof, and means for mixing the outputs from the resonators to derive a difference frequency dependent on the difference in concentration of impurities in the two samples.

4,104,586
APPARATUS FOR INDICATING THE SEQUENCE OF ALTERNATING CURRENT SIGNALS

Adrian Orton Newbould; Edward Piper Walker, both of Stafford, and Anthony Williams, Newport, all of England, assignors to The General Electric Company Limited, London, England

Filed Nov. 22, 1976, Ser. No. 744,087
Claims priority, application United Kingdom, Dec. 1, 1975, 49229/75
Int. Cl.[2] G01R *25/00*
U.S. Cl. 324—83 D 14 Claims

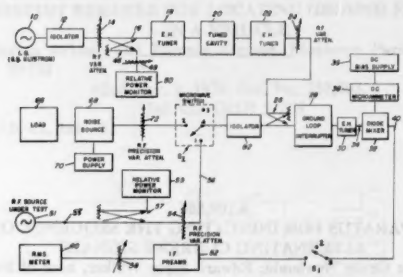


1. An apparatus for indicating the sequence of a pair of alternating current input signals comprising:
first means which produces an output having a first value when the two input signals are of the same polarity and a second value when the two input signals are of opposite polarity, to thereby indicate in respect of each datum crossing in both input signals the sense of that datum crossing with respect to the polarity of the other input signal at the time of that datum crossing;
second means which produces an output which assumes or remains at a first value in response to each datum crossing in one input signal and assumes or remains at a second value in response to each datum crossing in the other input signal; and
third means responsive to the output of said second and first menas which produces an output having a first value when the outputs of the first and second means both have their first values or both have their second values, and having a second value when the output of one of said first and second means has its first value and the other its second value, the output of the third means thereby having one value when one input signal lags the other, and its other value when that one input signal leads the other.

4,104,587
BANDWIDTH SUBSTITUTION METHOD AND SYSTEM FOR ABSOLUTE MEASUREMENT OF POWER AT ALL RADIO FREQUENCIES

Abraham Singer, Silver Spring, and Jan M. Minkowski, Baltimore, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 3, 1976, Ser. No. 692,270
Int. Cl.[2] G01R *21/00*
U.S. Cl. 324—95 **10 Claims**



1. A method for measuring coherent as well as incoherent (or noise) rf power from an rf source connected to a measuring system, the steps comprising:

measuring the i.f. noise bandwidth (B) of the system;

determining the temperature (T_o) of the system;

measuring the system noise factor by using a noise source;

measuring the system noise factor by using the rf source under test; and

calculating the rf power from a source under test according to the formula

$$P = \frac{kT_oB}{AI}\,\frac{2N-1}{Y-1} + 1$$

wherein:

Y is the Y-factor determined in the system noise factor measurement by use of the noise source;

N is the available excess noise power;

k is Boltzmann's constant;

I is the insertion loss; and

A is the numerical value of an attenuator setting in measuring the system noise factor in terms of the unknown available power from the rf source under test, taking into account losses and attenuation.

4,104,588
TAMPER PREVENTION APPARATUS FOR WATT-HOUR METER

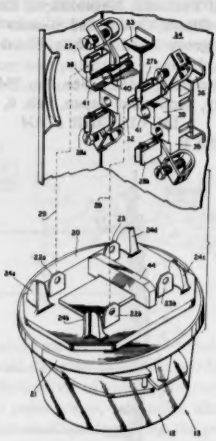
Wyman Westberry, St. Mary's, Ga. 31558

Filed Jan. 28, 1977, Ser. No. 763,360
Int. Cl.[2] G01R *11/24, 1/04;* H01R *13/20*
U.S. Cl. 324—110 **6 Claims**

4. Apparatus for tamperproofing a conventional electrical watt-hour meter of the type which has symmetrically disposed line contacts and load contacts, and which can conventionally be engaged in either of two operative modes with a converted meter box having symmetrically disposed line contacts and load contacts, said apparatus comprising:

at least one meter box obstruction member separate from and securable within said meter box in predetermined asymmetrical relation to said contacts within the meter box; and

a meter obstruction member separate from and securable to said meter in predetermined complementary asymmetrical relation to said meter contacts and in predetermined position to engage said meter box obstruction member, so as to

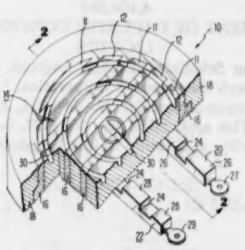


prevent engagement of said contact means in only one of said operative modes.

4,104,589
CHUCK FOR USE IN THE TESTING OF SEMICONDUCTOR WAFERS

Robert Lee Baker, Conyngham; Calvin Michael Mahoski, Hazleton; John David Partilla, Wilkes-Barre, and Harold Robert Ronan, Jr., Mountaintop, all of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 7, 1976, Ser. No. 730,332
Int. Cl.[2] G01R *31/02, 31/22;* H01B *13/00*
U.S. Cl. 324—158 F **13 Claims**



1. A chuck having a wafer receiving surface for testing semiconductor wafers comprising:

a first and a second plurality of electrically conductive members, said members being alternately arranged and substantially electrically isolated from each other;

means for retaining said members together such that said wafer receiving surface is provided;

means electrically connecting said first plurality of members together;

means electrically connecting said second plurality of members together;

means for attaching power and sensing means to said first and second members connecting means, respectively; and

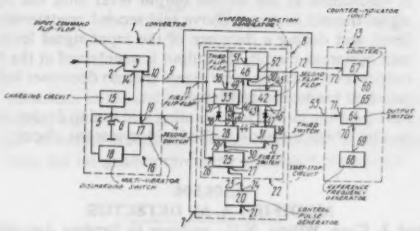
means, integral with said chuck for holding a semiconductor wafer to said wafer receiving surface.

4,104,590

DIGITAL DEVICE FOR MEASURING INSTANTANEOUS PARAMETER VALUES OF SLOWLY VARYING PROCESSES

Sergei Vasilievich Zhevnerov, ulitsa Geroev Sibiryakov, 30, kv. 103, Voronezh, U.S.S.R.

Filed Nov. 30, 1976, Ser. No. 746,005
Int. Cl.[2] G01P *3/48*
U.S. Cl. 324—166 12 Claims



1. A digital device for measuring instantaneous parameter values of slowly varying processes, comprising:

a time-to-voltage converter having an input, a first output and a second output;

an input command flip-flop of said converter having two outputs and

a counting input which is connected to the input of the converter and to an input of the device, a first of said outputs being connected to said second output of said converter;

a capacitor of said converter having

a leadout connected to said first output of said converter;

a charging circuit having an input connected to said second output of said input command flip-flop and an output connected to said leadout of said capacitor;

a discharging circuit having an input connected to a first output of said input command flip-flop and

an output connected to said leadout of said capacitor;

a hyperbolic function generator having

a control input connected to said leadout of said capacitor and

a command input connected to said second output of said converter;

a controlled pulse generator, with a linear modulation characteristic of said hyperbolic function generator, having

an input connected to the control input of said hyperbolic function generator;

a start-stop circuit of said hyperbolic function generator having

a first input connected to an output of said pulse generator,

a second input connected to the command input of said hyperbolic function generator, and

an output connected to the output of said hyperbolic function generator; and

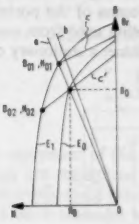
a counter-indicator unit having an input connected to said output of said hyperbolic function generator.

4,104,591

METHOD OF ADJUSTING A PERMANENT MAGNET BY USING A HYPOTHETICAL DEMAGNETIZATION CURVE LOWER THAN THE ACTUAL VALUE

Hans-Werner Reüting, Peine, Fed. Rep. of Germany, assignor to Elmeg Elektro-Mechanik GmbH, Peine, Fed. Rep. of Germany

Filed Aug. 2, 1976, Ser. No. 710,455
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1975, 2534419
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—205 23 Claims



1. Method of providing a permanent magnet with a particular magnetization, comprising the steps of:

providing a particular load condition for the magnet, which includes a parallel shunt for the magnet, the magnetic permeance of the magnet and of the shunt together exceeding the sum of a magnetic permeance of any additional load or load relief on the manget during subsequent use;

selecting a particular operation point in a hypothetical magnetic flux/field diagram which is inside of all actual demagnetization curves for magnetizable material from which the magnet is made, said operating point being determined based upon said particular load condition of the magnet, and providing a signal representation thereof;

magnetizing the magnet to establish a permanent magnetic state, the magnet obtaining therewith a particular demagnetization curve which does not include said point;

stepwise reducing the resulting permanent magnetization by particular demagnetization steps;

measuring a parameter indicative of the permanent magnetization in between the steps of the stepwise reducing "and comparing this parameter with the signal representation to determine" whether the particular operating point is approached said measuring being along a load characteristics for the magnet corresponding to magnetic flux extraction not larger than during normal load conditions during subsequent use of the magnet; and

terminating the stepwise reducing when the said point has been reached at least approximately.

4,104,592

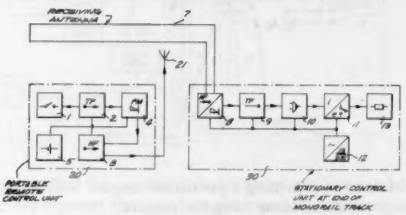
REMOTE CONTROL OF A MOBILE UNDERGROUND MACHINE, PARTICULARLY IN A MINE

Walter Rätz, Gelsenkirchen, and Werner Lindemann, Essen, both of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Sep. 22, 1976, Ser. No. 725,528
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1976, 2612368
Int. Cl.[2] H04B *1/00, 7/26*
U.S. Cl. 325—37 4 Claims

1. In combination with a mobile underground machine driven by an external stationary prime mover, the travelling underground machine having a substantially closed passenger compartment, a control arrangement therefor, the control arrangement comprising, in combination, a portable remote

control unit including a multi-step self-locking master switch having a plurality of settings corresponding to different control signals for the control of the prime mover and provided with a dead man's button for preventing unintentional generation of control signals, and an emergency stop switch for generating a stop signal for the prime mover, means for generating audio-frequency control signals corresponding to the settings of the master switch, means for frequency-modulating the control signals onto a high-frequency carrier, and a U-shaped ferrite transmitting antenna for transmitting the thusly modulated carrier out into space, an insulated conductor loop antenna extending along the path of travel of the mobile underground machine for receiving the thusly modulated carrier from the transmitting antenna of the portable remote control unit when the latter is being used from outside the passenger compartment of the machine; a stationary control unit electri-



cally connected to the conductor loop antenna and including means for receiving the thusly modulated carrier signal, demodulating the latter so as to recover the control signals, decode the control signals and in dependence upon the decoded control signals correspondingly control the operation of the prime mover of the mobile underground machine; an exterior ferrite rod transmitting antenna mounted on the mobile underground machine exteriorly of the passenger compartment; a holder inside the passenger compartment for holding the portable remote control unit when the human operator of the portable remote control unit is riding in the passenger compartment of the machine; and coupling means for coupling the transmitting antenna of the portable remote control unit when the latter is inside the passenger compartment to the exterior transmitting antenna, the coupling means comprising a high-frequency coupling circuit consisting of passive circuit components not requiring a separate electrical energy supply.

4,104,593

RECEIVER CIRCUIT INCLUDING AN HYSTERESIS CIRCUIT FOR USE WITH A REMOTE CONTROLLER

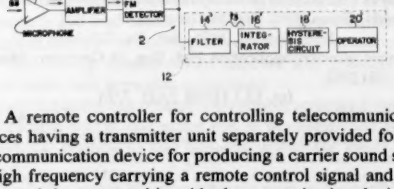
Toshio Orii, Daito, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Oct. 28, 1976, Ser. No. 736,369

Claims priority, application Japan, Oct. 28, 1975, 50-147539[U]

Int. Cl.[2] H04B *1/16*

U.S. Cl. 325—392 **14 Claims**



1. A remote controller for controlling telecommunication devices having a transmitter unit separately provided for said telecommunication device for producing a carrier sound signal of high frequency carrying a remote control signal and a receiver unit incorporated in said telecommunication device for operating various tuning devices in said telecommunication device upon receipt of said carrier signal from said transmitter, said receiver unit comprising;

(a) a converter means for converting a received carrier sound signal into an electrical signal;

(b) a hysteresis circuit connected to said converter means for receiving said electrical signal, said hysteresis circuit comprising means for producing one of a first or second output level signals wherein the first output level signal when the level of the input signal applied to said hysteresis circuit is higher than a second predetermined level which is higher than a first predetermined level and the second output level signal when the level of the input signal applied to the hysteresis circuit is less than the first predetermined level; whereby during an increase of the input signal level to said hysteresis circuit, the output therefrom is maintained at the second output level until the input signal thereto increases above said second predetermined level, and during a decrease of the input signal level to said hysteresis circuit, the output is maintained at the first output level until the input signal thereto decreases below said first predetermined level and

(c) an operating circuit for operating said tuning device upon receipt of the output signal of said hysteresis circuit.

4,104,594

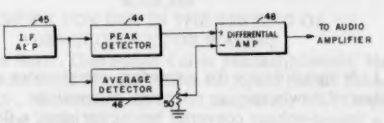
MODIFIED A. M. DETECTOR

Alfred J. Cann, Wilton, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Sep. 1, 1976, Ser. No. 719,560

Int. Cl.[2] H04B *1/12;* H03D *1/04*

U.S. Cl. 325—475 **13 Claims**



1. An a.m. receiver, comprising:

an input for receiving amplitude modulated desired and interfering signals;

an average detector coupled to said input, said average detector being used for detecting amplitude modulation on the desired signals while ignoring amplitude modulation on the interfering signals, and having a time constant short compared to the periods of the frequencies of the amplitude modulation; and

means for utilizing the amplitude modulation of the desired signals, said utilization means being coupled to said average detector.

4,104,595

SIGNAL TRANSLATING CIRCUIT FOR VARIABLE AREA CAPACITIVE PRESSURE TRANSDUCER

John Kenneth Overzet, Elmhurst, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 27, 1976, Ser. No. 754,381

Int. Cl.[2] G01M *27/00;* H03F *1/00*

U.S. Cl. 328—1 **2 Claims**

1. The combination of a variable area capacitive transducer of the type having two electrodes abutting each other, with a thin-film layer applied to one of the electrodes as a dielectric layer, and a signal translating circuit comprising:

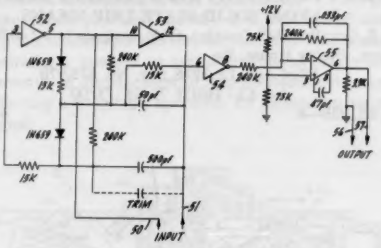
an astable multivibrator circuit for providing a square-wave output signal;

a capacitor, connected in the multivibrator circuit to determine the duty cycle of the square-wave signal;

a first conductor coupled between one of the transducer electrodes and one plate of said capacitor, and a second conductor coupled between the other transducer electrode and the other plate of said capacitor, to modify the

duty cycle of the output signal as a function of a change in the effective capacity of the transducer;

an integrating circuit connected to receive the square-wave signal and to provide a d-c signal which varies with the



variations in the duty cycle of the received square-wave signal; and

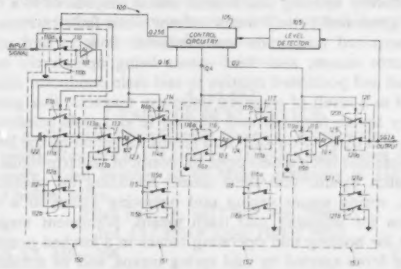
a pair of output conductors connected to pass the d-c signal from the integrating circuit to associated equipment.

4,104,596

INSTANTANEOUS FLOATING POINT AMPLIFIER

Miles A. Smither, Houston, Tex., assignor to Geosource Inc., Houston, Tex.

Filed Dec. 10, 1976, Ser. No. 749,218
Int. Cl.[2] H03F *1/00*
U.S. Cl. 330—9 **5 Claims**



1. An instantaneous floating point amplifier for ammplifying an input signal to a level within preselected limits, which comprises:

a plurality of *n* cascaded amplifier stages, wherein each amplifier stage includes an operational amplifier and wherein the gain, A_i, of the *i*th stage is given by the expression $A_i = (A_{i-1})^2$, for $i=2, 3, \ldots, n$, and where A_1 is the gain of the amplifier stage have the least gain of the *n* stages;

a level detector coupled to the output of the cascaded amplifiers for producing an output signal indicative of the voltage level of the signal at the output of the cascaded stages; and

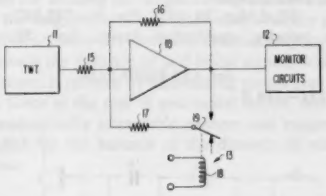
control circuitry for generating signals to sequentially enable each stage of amplification, said control circuitry responsive to the output signal produced by the level detector following enablement of each stage to retain that stage if it is required to amplify the input signal to a level within predetermined limits and to bypass that stage, if it is not required to amplify the input signal to a level within predetermined limits.

4,104,597

VARIABLE SENSITIVITY MONITOR CIRCUIT

Nelson Mortimer Jacobus, Jr., Kensington, Md., assignor to Communications Satellite Corp., Washington, D.C.

Filed Feb. 1, 1977, Ser. No. 764,608
Int. Cl.[2] H03F *3/58*
U.S. Cl. 330—43 **5 Claims**



1. In a process or equipment of the type wherein process or equipment conditions are monitored to detect an abnormal condition and wherein when said process or equipment is first started up or turned on, a transient having a magnitude substantially larger than the steady-state monitored condition limits is normally produced, the improvement comprising:

a gain switched device adapted to be connected between a monitored device a monitor circuit for detecting said abnormal condition of the monitored device, and

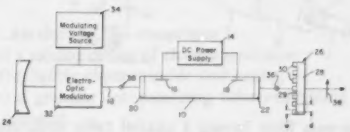
means actuated at start-up or turn-on of the monitored device for controlling said gain switched device to decrease the gain thereof during said transient and thereafter increase the gain of said gain switched device to a normal steady-state level thereby changing the sensitivity of the monitor circuit during the transient period from that during normal steady-state operation, said gain being decreased at start-up or turn-on by an amount sufficient to prevent expected transients normally encountered at start-up or turn-on from falsely indicating an abnormal condition, while allowing abnormal transients to be recognized during turn-on or start-up.

4,104,598

LASER INTERNAL COUPLING MODULATION ARRANGEMENT WITH WIRE GRID POLARIZER SERVING AS A REFLECTOR AND COUPLER

Richard L. Abrams, Pacific Palisades, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jun. 9, 1975, Ser. No. 584,788
Int. Cl.[2] H01S *3/10*
U.S. Cl. 331—94.5 M **4 Claims**



1. A laser modulation arrangement comprising:

a laser medium disposed along a predetermined axis;

means for exciting said laser medium to a condition of population inversion;

a reflective element spaced from one end of said laser medium along said axis and a wire grid polarizer spaced from the other end of said laser medium along said axis in such manner as to constitute a laser optical cavity for stimulating the emission of laser radiation from said medium along said axis;

an electrooptic modulator disposed along said axis within said laser optical cavity and responsive to an applied voltage to change the plane of polarization of said laser

radiation traversing said modulator by an angle dependent upon the magnitude of said applied voltage; and

means for applying a modulating voltage to said modulator.

4,104,599

CRYSTAL OSCILLATING CIRCUIT

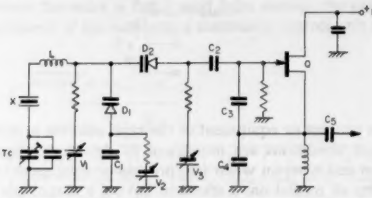
Masatoshi Tagawa, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1977, Ser. No. 782,897

Claims priority, application Japan, Apr. 20, 1976, 51-49516[U]

Int. Cl.² H03B *5/36*

U.S. Cl. 331—116 R **5 Claims**



1. A quartz crystal variable frequency oscillation circuit comprising

an active oscillation element;

a quartz crystal resonant element connected to said active oscillation element;

first and second variable capacity diodes respectively connected in series and in parallel with said quartz crystal resonant element; and

variable control voltage means connected to said first and second variable capacity diodes for applying variable control voltages to said variable capacity diodes and thereby varying the frequency of said oscillation circuit so that the amplitude of the output from said oscillation circuit remains substantially constant over a broad frequency range.

4,104,600

INTEGRATED ABSORPTIVE POWER LINE FILTERS

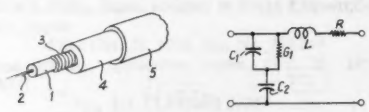
Ferdy P. Mayer, 18 rue Thiers, 38000 Grenoble, France

Filed Oct. 5, 1976, Ser. No. 729,628

Claims priority, application France, Oct. 6, 1975, 75 30476

Int. Cl.² H04B *3/28*; H01H *7/14*; H01P *1/00*

U.S. Cl. 333—79 **4 Claims**



1. A low-pass filter having a coaxial cable structure and including at least four layers, comprising:

(a) a lossy magnetic core,

(b) a single layer winding of closely spaced conductive wire surrounding said core,

(c) a special magnetic layer surrounding said winding, and

(d) a conductive outer sheath surrounding said magnetic layer and adapted to be connected to a ground terminal,

wherein the magnetic effects of the core and of the special magnetic layer are of the high frequency absorptive type through magnetic and dielectric losses, and the outer layer is so formed as to comprise a conductive path to ground great enough to introduce an important ground conductance with a resistivity sufficient to admit the penetration of currents and fields at frequencies equal to or higher than the maximum utilization frequency.

4,104,601

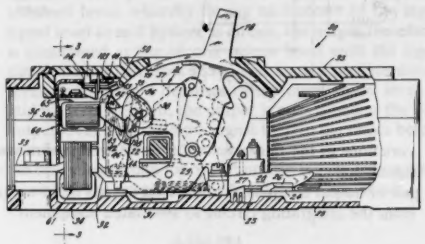
DIRECT FAULT TRIPPING OF CIRCUIT BREAKER HAVING SOLID STATE TRIP MEANS

Carl E. Gryctko, Bellefontaine, Ohio, assignor to I-T-E Imperial Corp., Spring House, Pa.

Filed Apr. 12, 1976, Ser. No. 675,970

Int. Cl.² H01H *71/24, 73/00*

U.S. Cl. 335—6 **4 Claims**



1. A circuit breaker including cooperating contact means; main conductor means in series with said contact means; an operating mechanism operatively connected to said contact means; a latch means normally maintaining said mechanism latched in position for opening and closing said contact means; first means for monitoring currents flowing in said main conductors means; second means including solid state circuitry for processing signals generated by said first means; third means for releasing said latch means to automatically trip said mechanism thereby opening said contact means responsive to a trip signal generated by said second means when fault currents of predetermined magnitude and character flow in said main conductor means; said third means being operatively constructed and positioned relative to said main conductor means so that as a result of magnetic coupling, magnetic flux generated by severe fault currents flowing in said main conductor means acts directly on said third means for actuating the latter to release said latch means prior to receipt of said trip signal by said latch means; said third means including an operating means, spring means urging said operating means to a trip position for releasing said latch means, permanent magnet means for holding said operating means in a latched position against force exerted by said spring means, and an actuating coil operatively positioned whereby current flowing therein generates a flux which bucks flux of said permanent magnet whereby said permanent magnet releases said operating means when said trip signal is applied to said third means; and magnetic director means operatively positioned to control direct magnetic coupling between said main conductor means and said permanent magnet.

4,104,602

PNEUMATIC TIMER

Teizo Fujita, Ibaraki; Shunzo Yoshida, Takatsuki, and Toshio Koizumi, Kashihara, all of Japan, assignors to Izumi Denki Corporation, Osaka, Japan

Filed Dec. 7, 1976, Ser. No. 748,368

Claims priority, application Japan, Apr. 5, 1976, 51-38411

Int. Cl.² H01H *7/03*

U.S. Cl. 335—61 **29 Claims**

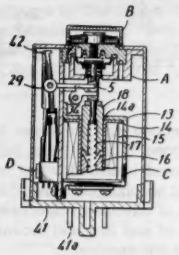
1. A pneumatic timer, comprising:

a pneumatic timing mechanism including displacement means adapted to be displaced in a predetermined direction from an initial position to a displaced position with a time characteristic determined as a function of a pneumatic resistance;

means for providing an input signal;

means operatively coupled to said displacement means for normally urging said displacement means toward said initial position and for allowing displacement of said displacement means in said predetermined displacement direction in response to said input signal;

contact means provided laterally of at least one of said timing mechanism and said displacement allowing means and operatively coupled to said displacement means and responsive to displacement of said displacement means for effecting a switching operation for generating an output signal;



said contact means including a first cam rotatably provided in association with the displacement of said displacement means, said first cam comprising one arm operatively coupled to said displacement means and the other arm extending in the direction perpendicular to said one arm; and

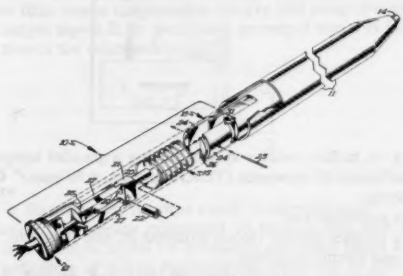
a first leaf contact member extending in the same direction as said predetermined displacement direction and operatively coupled to the other arm of said first cam, whereby said leaf contact member is switch operated in association with rotation of said first cam.

4,104,603

TACTILE FEEL DEVICE

Jay A. Wheeler, Minneapolis; Henry L. Miszkiewicz, Minnetonka; Ronald O. J. Lindberg, Hopkins, and James A. Willmore, Eden Prairie, all of Minn., assignors to HEI, Inc., Chaska, Minn.

Filed Feb. 16, 1977, Ser. No. 769,051
Int. Cl.[2] H01F 7/04; H01H 5/02
U.S. Cl. 335—306 **8 Claims**



1. In a tactile feel device utilizing axial compressive movement resisted by biasing means and magnetic force to achieve suitable resistance to movement and breakaway feel, and having an actuator member coaxially and reciprocally disposed with respect to a fixed member, thereby defining an overall stroke for said device, a magnet mounted to one of said members, a magnetically attractable element mounted to the other of said members, and means biasing said members coaxially apart causing said magnet to engage said magnetically attractable element, the improvement comprising:

a. means mounting said magnet to said one member and mounting said magnetically attractable element to said other member, to permit limited axial sliding movement of said magnet with said magnetically attractable element engaged therewith, relative to one of said members, thereby defining initial stroke; and

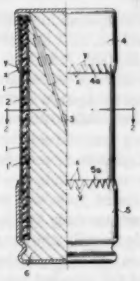
b. means for limiting the length of said initial stroke to less than the length of said overall stroke, whereby axial compressive actuator movement is resisted only by said biasing means the distance of said initial stroke, whereby said movement is resisted by said biasing means plus said magnetic force at the end of said initial stroke, and whereby the magnetically attractable element and magnet are disengaged for the balance of the distance of said overall stroke.

4,104,604

NARROWLY KNAULED END CAP FOR AN ELECTRIC FUSE

Delbert L. George, Salem, N.H., assignor to Gould Inc., Newburyport, Mass.

Filed Jul. 26, 1977, Ser. No. 819,061
Int. Cl.[2] H01H 85/02
U.S. Cl. 337—248 **4 Claims**



1. An electric fuse comprising

(a) a tubular casing of electric insulation;

(b) a fusible element inside said casing;

(c) a granular arc-quenching filler embedding said fusible element;

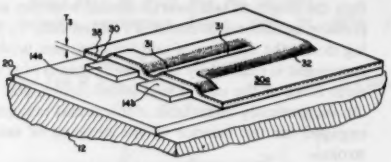
(d) said casing comprising an outermost and an innermost ply of woven glass cloth and at least one intermediate ply of nonwoven glass fiber mat, each of said plies overlapping in a direction longitudinally of said casing, and said casing further comprising a polyester resin integrating said plies into a laminate; and

(e) a pair of ferrules press-fitted on the ends of said casing and conductively interconnected by said fusible element, said pair of ferrules being shaped at the axially inner ends thereof to form narrowly knurled frustums of cones, the knurled area encompassing the entire periphery of said axially inner ends of said pair of ferrules rather than spaced points thereof.

4,104,605
THIN FILM STRAIN GAUGE AND METHOD OF FABRICATION

Lee J. Boudreaux, Schenectady, N.Y., and James H. Foster, Cincinnati, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 15, 1976, Ser. No. 723,566
Int. Cl.[2] G01L 1/22
U.S. Cl. 338—2 17 Claims



1. A method for fabricating a thin film resistive strain gauge upon a surface of an article, comprising the steps of:

R.F. sputtering a first film of an insulating material, selected from the group consisting of Alumina and Forsterite, to a first thickness upon said article surface;

selecting a strain-sensing resistive material from the group of materials consisting of Nichrome, platinum, molybdenum silicide and chromium silicide;

fabricating a pattern of the strain-sensing resistive material upon a surface of said first insulating film furthest from said article; fabricating, upon said surface of said first insulating film and substantially co-planar with said pattern, conduction means for electrically coupling directly to said pattern to ascertain the value of the resistance thereof; and

R.F. sputtering a second film of the selected insulating material directly in contact with and covering all of said pattern and at least a portion of said conduction means and adjacent regions of said first insulating film.

8. A thin film strain gauge for use upon a surface of an article, comprising:

a first film of an insulating material fabricated directly upon said article surface, said insulating material being one of Alumina (Al_2O_3) and Forsterite ($2MgO\text{-}SiO_2$);

at least one member of a resistive strain-sensing material fabricated directly upon a surface of said first insulating film furthest from said article surface;

said strain-sensing material selected from a group consisting of Nichrome, platinum, molybdenum silicide and chromium silicide;

first means fabricated upon said surface of said first insulating film and substantially co-planar with said at least one member for electrically coupling to said at least one member to ascertain the value of the resistance thereof; and

a second film of the selected insulating material fabricated directly over said at least one member, a portion of said first means and adjacent regions of said first insulating film surface to encapsulate said at least one element and said portion of said first means in cooperation with said first insulating film.

4,104,606
DIMMER SWITCH WITH INSULATION HOUSING

Robert R. DeWitt, Slatington, Pa., assignor to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Dec. 23, 1976, Ser. No. 754,101
Int. Cl.[2] H01C 10/50
U.S. Cl. 338—198 27 Claims

1. An in-line switch for an electrical circuit comprising, in combination:

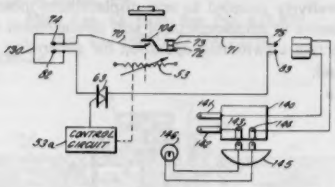
a housing for enclosing said in-line switch;

an externally operable operating member extending through said housing;

a pair of cooperating contacts operable by said operating member and operated thereby between engaged and disengaged positions;

first and second pairs of terminals positioned at opposite sides of said housing,

said first and second pairs of terminals each comprising first and second spaced conductive stabs disposed in respective first and second elongated channels;



and first and second plunger means being movable in said first and second channels and being adapted to force parallel-disposed insulated wires into engagement with said first and second stabs respectively of said first and second pairs of terminals respectively;

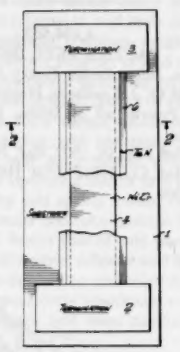
said first stabs of said first and second pairs of stabs being connected to one another;

said second stabs of said first and second pairs of stabs being connected to respective ones of said pairs of contacts.

4,104,607
ZERO TEMPERATURE COEFFICIENT OF RESISTANCE BI-FILM RESISTOR

William Kinzy Jones, Cambridge, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 14, 1977, Ser. No. 777,225
Int. Cl.[2] H01C 1/012
U.S. Cl. 338—309 9 Claims



1. A bi-film resistor system having a parallel temperature coefficient of resistance (TCR) less than ±50 ppm/° C comprising:

a substrate, and

a parallel resistor circuit mounted on said substrate,

said circuit including:

elongate coaxially-disposed first and second thin-film resistor members formed of selected materials having substantially equal resistance values per square (Ω/□) with said first member overlying said second and being formed of a material that is anodically non-reactive and has a negative TCR, said second being anodically reactive and having a positive TCR, and

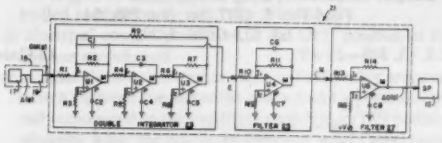
conductive terminal members coupled to each end of each member,

said thin film members being of substantially equal electrical length with first member being of sufficient width for blanketing said second and providing anodic passivation protection for it; said materials having positive and negative TCRs of such values that, when included in said parallel circuit algebraically, add to provide said parallel TCR of less than ±50 ppm/C°.

4,104,608
HEAVE METER

Norman D. Melling; John J. De Matteo, both of Doylestown; Melvyn A. Levrant, Holland, all of Pa., and Ronald J. Juels, Freeport, N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 30, 1977, Ser. No. 782,661
Int. Cl.² G01S 9/66
U.S. Cl. 340—3 PS **8 Claims**



1. A contour mapping system for measuring bottom elevation from a ship, with heave compensation, comprising:

gravity metering means for producing a signal GM(s) indicative of gravity at the ship, including accelerometer means for measuring the vertical acceleration, and frequency compensating means for attenuating non-gravimetric frequencies;

heave metering means connected to receive said signal GM(s) for producing a signal ΔD(s) indicative of the heave displacement including integrator means adapted to receive a gravity meter output signal GM(s) for producing an output signal E indicative of the relationship

$$[G]\ GM(s)\left[\frac{\frac{S}{\omega_f^2}}{\frac{S^2}{\omega_f^2}+\frac{2\zeta S}{\omega_f}+1}\right]$$

where:

s = complex Laplace transform operator,

ω_f = filter transfer function breakpoint frequency, and

ζ = filter transfer function damping constant;

first filter means connected to receive said integrator means output signal E for producing an output signal N indicative of the relationship

$$[M]\ E\left[\frac{1}{S+\frac{1}{\tau_f}}\right]$$

where

τ_f = filter transfer function cutoff breakpoint; and

second filter means connected to receive said first filter means output signal for producing an output signal ΔD(s) indicative of heave displacement according to the relationship

$$N\left[\frac{\tau_g}{\tau_f}\right]$$

where

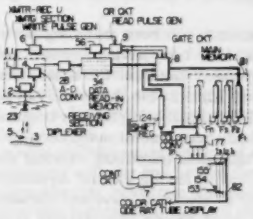
τ_g = gravity meter breakpoint; and

depth measuring means connected to receive said signal ΔD(s) for producing a signal indicative of the heave compensated vertical distance from the ship to the bottom.

4,104,609
FISH-FINDER

Yukihiko Minegishi, 451-54, Noba-cho, Konan-ku, Yokohama-shi, Kanagawa-ken; Shokichi Sato, 105, 6-2, 2-chome, Fuchinobe, Sagamihara-shi, Kanagawa-ken, and Toshikazu Yamada, Sakaeso, 7-20, 3-chome, Ichikawa, Ichikawa-shi Chiba-ken, all of Japan

Filed May 16, 1977, Ser. No. 797,145
Claims priority, application Japan, May 19, 1976, 51-57676; May 19, 1976, 51-57677; Nov. 17, 1976, 51-138029
Int. Cl.² G01S 9/70, 7/62
U.S. Cl. 340—3 C **21 Claims**



1. A fish-finder comprising:

a transmitter-receiver unit for periodically emitting an ultrasonic pulse into the water and receiving its reflected wave, the transmitter-receiver unit including a reference oscillator, a frequency divider for frequency dividing the oscillation output from the reference oscillator, a range switch for selectively changing the frequency dividing ratio of the frequency divider in accordance with the detection range adopted and means for deriving a transmission pulse from the output from the frequency divider;

an A-D converter connected to the transmitter-receiver unit for converting the received reflected wave into a digital signal;

a main memory supplied with the digital signal, having a storage capacity of one picture frame and repeatedly read out;

a color converter supplied with the output from the main memory to convert it into a color signal corresponding to the value of the output digital signal;

a color cathode ray tube display supplied with the color signal;

a normal display data read-in memory supplied with the output from the A-D converter before it is supplied to the main memory and having a capacity corresponding to the number of picture elements of one display line of the color cathode ray tube display;

a data write pulse generator supplied with the output from the frequency divider to change the output frequency in accordance with the setting of the range switch and generate write pulses of the same number as the picture elements of one display line, thereby controlling data writing in the data read-in memory; and

control means for transferring the digital signal from the read-in memory to the main memory so that the digital signal is displayed in the form of one display line at a predetermined position of the screen of the color cathode ray tube display and display lines provided until they are each shifted to the older display line to remove the oldest display line.

4,104,610

ULTRASONIC WAVE HORN

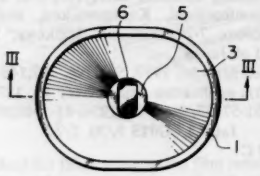
Hiromitsu Inoue, Kyoto; Susumu Katayama, and Hiroshi Ohashi, both of Hirakata, all of Japan, assignors to Matsushita Electric Works, Ltd., Osake, Japan

Filed Dec. 10, 1976, Ser. No. 749,287

Claims priority, application Japan, Dec. 15, 1975, 50-149809; Jun. 30, 1976, 51-78069; Jun. 30, 1976, 51-78075

Int. Cl.[2] H04B *11/00*

U.S. Cl. 340—15 **10 Claims**



1. An ultrasonic wave horn including an outwardly and uniformly flaring horn body having a constricted throat at one end and an expanded mouth at the other, means defining a transducer cavity adjacent the throat and having a front wall and a back wall, the throat being entirely contained in the front wall, the horn body being unobstructed between the throat and the mouth, an ultrasonic transducer adjacent the back wall of the transducer cavity having electric terminals and for converting between an electrical wave and ultrasonic vibrations, the horn body being oblong in transverse cross section and symmetrical in shape to define major and minor axes, the throat being also oblong in transverse cross section and symmetrical in shape to define major and minor axes, the major axes being arranged at right angles to one another.

4,104,611

SUPPRESSING CONSTANT FREQUENCY NOISE IN SEISMIC RECORDS

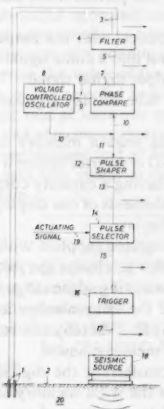
Adrianus B. Kalden, Rijswijk, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 21, 1977, Ser. No. 789,461

Claims priority, application United Kingdom, Apr. 4, 1976, 18185/76

Int. Cl.[2] G01V *1/36*

U.S. Cl. 340—15.5 F **12 Claims**



1. An apparatus for removing an unwanted sinusoidal noise signal having constant frequency and amplitude from a seismic signal, said apparatus comprising:

monitoring means for monitoring the noise signal and detecting the phase pattern thereof;

a pulse selector circuit, said pulse selector circuit being coupled to said monitoring means to produce first and second trigger signals in response to first and second zero crossings of said noise signal and an actuating signal; said trigger pulses being separated by at least a plurality of periods of the noise signal;

a trigger circuit, said trigger circuit being coupled to said pulse selector circuit; and

a seismic source, said trigger circuit being coupled to said seismic source to fire said source in response to said first and second trigger pulses.

4,104,612

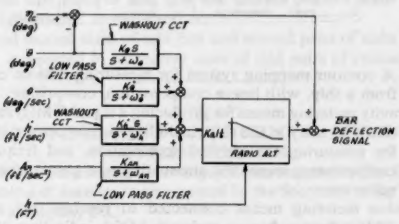
HEAD-UP DISPLAY COMMAND BAR GENERATOR

James R. Lowe, Palos Verdes, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Feb. 3, 1977, Ser. No. 765,254

Int. Cl.[2] G08G *5/00*

U.S. Cl. 340—27 AT **13 Claims**



1. Apparatus for providing to the pilot of an aircraft during visual landing approaches the image of a horizontal bar projected onto the lens of a head-up display, said bar indicating to the pilot the point at which the aircraft will touch down on the runway, said apparatus comprising;

means for generating a fixed angle signal proportional to the desired approach angle of descent,

means for generating a lead compensation signal,

means for generating a gain factor signal that varies as a function of aircraft altitude,

a multiplier circuit for generating the product of said lead compensation signal and said gain factor signal, and

a summing amplifier for adding said fixed angle signal and the product generated by said multiplier circuit to control the vertical deflection of said horizontal bar.

4,104,613

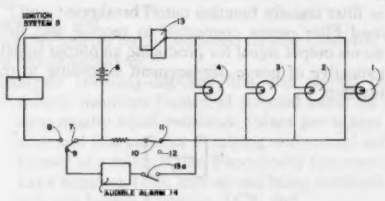
VEHICLE HEADLIGHT ALARM

Stanley H. Chaput, Sarnia, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 28, 1977, Ser. No. 763,642

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—52 D **1 Claim**



1. A vehicle headlight alarm for an automotive vehicle having headlights, tail lights, an ignition system, a battery, an

ignition switch electrically connected between the battery and the ignition system for selectively controlling the ignition of the vehicle, said ignition switch having an ON position in which it conducts electrical energy from the battery to the ignition system and an OFF position in which it prevents electrical energy from the battery from reaching the ignition system and a headlight switch electrically connected between the battery and the headlights and tail lights for selectively controlling the energization of said lights, said headlight switch having an ON position in which it conducts electrical energy from the battery to the lights and an OFF position in which it prevents electrical energy from the battery from reaching the lights, said vehicle headlight alarm comprising

a relay having an energizing winding electrically connected between the battery and the lights in a manner whereby when the headlight switch is ON the relay winding is energized and when the headlight switch is OFF the relay winding is deenergized and a relay armature switch controlled in position by said relay winding;

an electrical contact positioned at the OFF position of the ignition switch; and

an audible alarm connected in series with the relay armature switch between the electrical contact and a point electrically connected to the headlight switch in its ON position whereby when the headlight switch is in its ON position and the ignition switch is in its OFF position, the relay energizing winding is energized by the battery via the headlight switch and closes its relay armature switch to actuate the alarm.

4,104,614

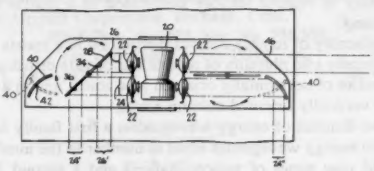
WARNING LIGHT FOR EMERGENCY VEHICLES

Alan Litman, Pittsburgh, Pa., assignor to Smith & Wesson Chemical Company, Inc., Pittsburgh, Pa.

Filed Mar. 10, 1976, Ser. No. 665,357

Int. Cl.[2] B60Q *1/46*

U.S. Cl. 340—81 R **22 Claims**



1. Warning light apparatus for emergency vehicles comprising a light source carried by said apparatus for projecting a light beam along a predetermined path, a first reflector carried by said apparatus for rotation about a generally vertical axis and having a reflective surface, said reflective surface being disposed in the path of said light beam when said reflector lies in a first rotary position to reflect the light beam in a first direction, said reflector being movable to a second rotary position to position the reflective surface out of the path of said light beam, a second reflector carried by said apparatus and having a reflective surface, said second reflector being located in the path of said light beam a greater distance from said light source than said first reflector so that when said first reflector lies in said second rotary position the second reflector reflects said light beam in substantially a like direction as said first direction.

4,104,615

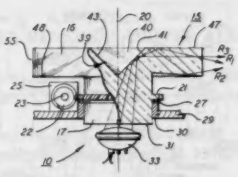
FLASHING SIGNAL LIGHT

Everest C. Hunter, Syracuse, N.Y., assignor to R. E. Dietz Company, Syracuse, N.Y.

Filed Dec. 16, 1976, Ser. No. 750,951

Int. Cl.[2] B60Q *1/52*

U.S. Cl. 340—84 **6 Claims**



1. A warning device for creating a moving visual signal including

a rotatably mounted signal generator constructed of a light transmitting material capable of conducting light internally, said generator being formed of two cylindrical sections coaxially aligned along the central axis of the generator with a first section being of greater diameter than a second section,

a stationary source of illumination positioned adjacent to and in close proximity with the end face of the second cylindrical section whereby light from said source is directed into the generator through said end face along the central axis of said generator,

a plurality of reflecting surfaces formed in the first cylindrical section being arranged to intercept the light directed into said generator and redirect the light internally within a plane substantially normal to the axis of said generator whereby a plurality of light beams, equal in number to the number of reflecting surfaces, exit said generator through the cylindrical outer periphery of the first cylindrical section, and

drive means operatively associated with the generator for rotating the generator about its axis whereby the beams of light exiting the generator are swept through a circular path of travel normal to the axis of rotation.

4,104,616

HAND OPERATED OPTICAL CHARACTER RECOGNITION SYSTEM

Isao Isshiki, and Koji Sato, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 28, 1977, Ser. No. 763,759

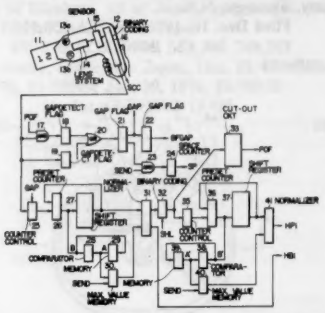
Claims priority, application Japan, Jan. 28, 1976, 51-8703; Feb. 17, 1976, 51-16823; Mar. 20, 1976, 51-30568; Mar. 20, 1976, 51-30569; Jun. 30, 1976, 51-78196

Int. Cl.[2] G06K *9/12*

U.S. Cl. 340—146.3 Y **35 Claims**

1. A character recognition system, comprising: a scanner having an aligned, one dimensional array of photosensitive elements mounted thereon and grouped into a plurality of sections, each section including at least one of said photosensitive elements and forming a unit region, said scanner being adapted to be moved in a direction substantially normal to the direction of alignment of said array to thereby scan characters and/or symbols arranged in parallel with the scanning direction, first means responsive to an output of said scanner for counting the number of occurrences of character segments for each of said unit regions to obtain a segment occurrence frequency distribution in the direction of alignment of said array, second means responsive to an output of said scanner for counting the number of scans in the direction of alignment of said array for each of said unit regions, starting when the first and/or last character segment is detected and ending when one character scan is completed, to thereby obtain the front side

and/or rear side shape of the character, and third means for recognizing the character according to the character segment



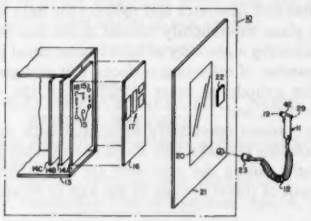
occurrence frequency distribution and the front and/or rear shape of the character.

4,104,617

CONTROL PANEL SYSTEM

Lawrence M. Bean, Ellicott City; Robert W. Edwards, Glen Burnie, and Theodore Wright, Crownsville, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 21, 1977, Ser. No. 761,165
Int. Cl.[2] G06F *3/02*
U.S. Cl. 340—147 R **13 Claims**



1. A control panel system, comprising

a panel having a plurality of spaced locations, each location being designated for the switching of respective apparatus to a selected state;

a light-emitting means for each of the switching locations of the panel;

switching means operable from one predetermined state to another predetermined state associated with each of the light-emitting means;

a manually manipulable probe having a light-sensitive means attached thereto for placing the light-sensitive means in optical relationship with a selected one of the light-emitting means;

a trigger means operable manually to a first and second condition;

first circuit means coupled to each light-emitting means operative to cause each light-emitting means to emit repetitively a first distinct code, the emission of each first distinct code for each location being different than the emitted first code for another location;

second circuit means responsive to the optical relationship of the light-sensitive means and any one of the light-emitting means to detect the reception of a respective first code at times when the trigger means is in its first condition;

third circuit means responsive to the reception of each first distinct code by the light-sensitive means and the operation of the trigger means to its second condition to convert a respective first code to a distinct second code representative of the respective received first code; and

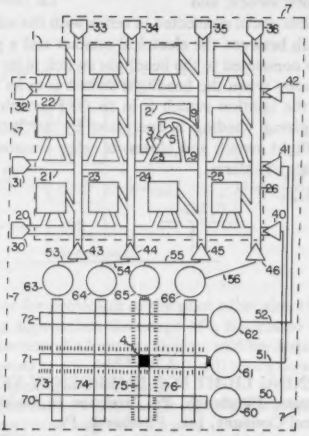
control circuit means responsive to the detection of the reception of the first distinct code by the second circuit means followed by the reception of its representative second distinct code generated by the third circuit means to operate the switching means associated with the light-emitting means that is emitting said first distinct code.

4,104,618

REMOTE SIGNALING SYSTEM

Marvin Stanley Towsend, 1365 Potomac Hts. Dr., Oxon Hill, Md. 20022

Continuation-in-part of Ser. No. 732,784, Oct. 15, 1976, which is a continuation of Ser. No. 586,512, Jun. 12, 1975, abandoned. This application Jun. 1, 1977, Ser. No. 802,558
Int. Cl.[2] G08B *25/00*
U.S. Cl. 340—524 **9 Claims**



1. A remote signaling system for simultaneously monitoring signals, at a central console display, which are generated from a plurality of remote stations distributed in a matrix array, comprising:

a. a plurality of remote stations distributed in a matrix array whereby said plurality of remote stations are distributed in a series of horizontally oriented row zones, and in a series of vertically oriented column zones;

b. two families of energy waveguides, a first family having row energy waveguides equal in number to the number of said row zones of remote stations and a second family having column energy waveguides equal in number to the number of said column zones of remote stations;

c. sources of wave energy for coupling to said row and column energy waveguides and a detector of wave energy coupled to each of said row and column energy waveguides at the detector end of each waveguide;

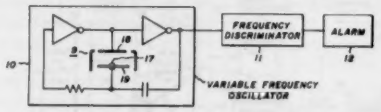
d. at each remote station, energy beam combiners connected with said row and column energy waveguides and a sensor-controlled wave energy source coupled to said energy beam combiners for signaling the central console by decreasing or increasing the wave energy which normally passes through the remote station along its associated row and column energy waveguides; and

e. at the central console, a display of zonal indicators associated with said row and column wave energy detectors for displaying the location of the remote station in which sensor-controlled wave energy signals are generated.

4,104,619
SMOKE DETECTOR

Joseph P. Hesler, Liverpool, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Oct. 1, 1976, Ser. No. 728,524
Int. Cl.[2] G08B *17/10*
U.S. Cl. 340—629 11 Claims



1. A smoke detector comprising:

A. a smoke detection cell including:

(1) a measuring chamber open to the ambient air and any airborne products of combustion,

(2) a source of radiation disposed within said chamber for ionizing the contained air and airborne matter,

(3) a pair of spaced conductive electrodes disposed within said chamber for establishing an electric field which attracts positively ionized particles to one electrode and negatively ionized particles to the other electrode, ionic impingement on said electrodes producing a small current whose direction depends on field polarity, the detection cell current decreasing and its resistance increasing when airborne combustion products are present in the air, and

B. an electrical network into which said detection cell is connected, comprising:

(1) an alternating voltage source,

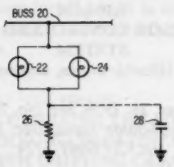
(2) means for applying said alternating voltage to said detection cell to provide a bidirectional current flow therein, and

(3) sensing means responsive to a network parameter dependent on the resistance of said detection cell for actuating an alarm when a predetermined increase in resistance of said detection cell has taken place indicating the presence of airborne combustion products.

4,104,620
DUAL FILAMENT CURRENT LIMITING AND STATUS INDICATING CIRCUIT

Michael Joseph Cronin, Sherman Oaks, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Dec. 30, 1976, Ser. No. 755,558
Int. Cl.[2] G08B *21/00*; H01J *7/42*
U.S. Cl. 340—642 21 Claims



1. An electrical circuit comprising:

first and second terminals;

lamp means connected to said first terminal, said lamp means including a plurality of filaments connected in parallel;

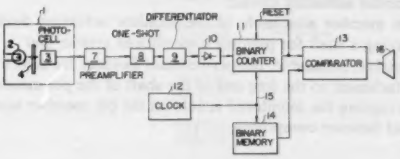
switch means connected between said lamp means and said second terminal; and,

impedance means connected in parallel with said switch means between said lamp means and said second terminal, said impedance means having a value such that the current through the filaments of said lamp means when said switch means is open is insufficient to illuminate said lamp means, said value also being such that the same total current through less than all of the filaments of said lamp means due to the failure of one of said filaments is sufficient to illuminate said lamp means to a first illumination level with said switch means open whereby the status of said lamp means is indicated.

4,104,621
STEERING-WHEEL REVERSAL DRIVER ALERTNESS MONITOR

Takayuki Yanagishima, and Akira Matsumura, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Aug. 19, 1976, Ser. No. 715,827
Claims priority, application Japan, Aug. 20, 1975, 50-101610; Sep. 3, 1975, 50-107453
Int. Cl.[2] G08B *21/00*; B60R *27/00*
U.S. Cl. 340—576 4 Claims



1. A driving assurance system for a wheeled vehicle having a steering wheel, comprising: first means for detecting in use the oscillatory angular movement of a steering wheel of a wheeled vehicle to generate an electrical pulse for every angular movement exceeding a predetermined arcuate extent smaller than 10° so that a series of pulses are generated when the angular movement exceeds an integral multiple of said arcuate extent, a monostable multivibrator connected to said detecting means to generate an output pulse in response to the first one of a series of said electrical pulses, said output pulse having a predetermined duration greater than the greatest possible interval between successive ones of said electrical pulses generated when the driver is normally operating the steering wheel, second means for generating a signal of which the magnitude increases in the presence of said output pulses, and third means for comparing at predetermined intervals the magnitude of said signal with a reference value to generate a warning signal if said signal is less than said reference value.

4,104,622
MONITOR ACTUATING DEVICE AND REUSABLE FASTENER THEREFOR

Clarence R. Van Niel, North Olmsted, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 2, 1975, Ser. No. 636,901
Int. Cl.[2] G08B *21/00*; A44B *9/00*
U.S. Cl. 340—572 18 Claims

1. A reusable, releasable, tamper resistant fastener for attachment to the end of a shaft, said fastener comprising:

a generally hollow body having an upper portion and a lower portion, said lower portion defining a bore opening to the bottom surface of said lower portion for receipt of the shaft, said lower portion including a generally tubular member at least partially defining the bore adjacent the opening thereto, said tubular member axially movable relative to the upper portion, said tubular member having an outer cam surface tapered radially inwardly and towards the opening to the bore, radially inwardly directed force on said cam surface being effective to resiliently deform said lower portion to resiliently move said tubular member towards said upper portion; and

a resilient one-piece spring steel clip mounted within said body, said clip having a base axially fixed and freely rotat-

able relative to said upper portion and a generally dome shaped portion having a generally concave inner surface and a generally convex outer surface arranged concave surface towards the opening to the bore, said dome shaped portion having an aperture therein generally coaxial with said bore and having a cross section having at least one dimension smaller than the cross section of the shaft, a plurality of generally radially extending slits in said dome shaped portion intersecting said aperture and dividing said dome shaped portion into a plurality of spring fingers adjacent said aperture, said fingers being resiliently radially outwardly deformable upon the application of an axial force to said concave surface to enlarge said aperture,

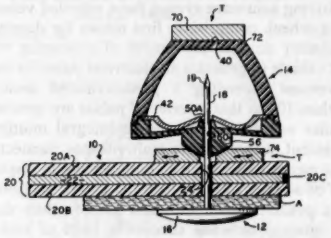
said axially movable tubular member being engageable with said concave surface to resiliently radially outwardly deform said spring fingers upon resilient movement of said tubular member towards said upper portion.

8. A monitor actuating device attachment assembly comprising:

a monitor actuating device,

a pin member attachable to the monitor actuating device having a shaft for piercing a monitored article; and

a reusable, releasable, tamper-resistant fastener for selective attachment to the free end of the shaft of the pin member to capture the monitored article on the pin member shaft, said fastener comprising:



a body having an upper portion and a lower portion, said lower portion defining a bore opening to the exterior surface of the lower portion for receipt of the shaft, said lower portion including a member being axially movable relative to the upper portion and having an outer cam surface tapered radially inwardly and away from the upper portion, radially inwardly directed force on said cam surface being effective to resiliently move said axially movable member towards said upper portion; and

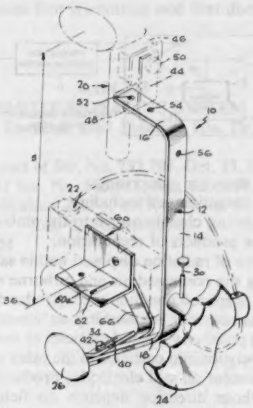
a resilient spring steel clip mounted within said body, said clip having a base axially fixed and freely rotatable relative to the upper portion and a generally dome shaped portion defining a generally concave inner surface and a generally convex outer surface arranged concave surface towards the opening to the bore, said dome shaped portion having an aperture therein generally coaxial with said bore and having a cross section having a least one dimension smaller than the cross section of the shaft, a plurality of generally radially extending slits in said dome shaped portion intersecting said aperture and dividing said dome shaped portion into a plurality of spring fingers adjacent said aperture, said fingers being resiliently radially outwardly deformable upon the application of an axial force to said concave surface to enlarge said aperture, said axially movable member being engageable with said concave surface to resiliently radially outwardly deform said spring fingers when said member is resiliently moved towards said upper portion.

4,104,623

FRAME FOR HOLDING A CAMERA

Conrad Beebe Sloop, 9092 Bermuda Dr., Huntington Beach, Calif. 92646

Filed Nov. 6, 1975, Ser. No. 629,531
Int. Cl.[2] G03B *17/56*
U.S. Cl. 354—293 **1 Claim**



1. Camera holding apparatus designed to be held by a photographer and to hold the tripod socket of a camera with a rotatable lens barrel, comprising:

a frame;

a camera support having a tripod-engaging portion for engaging the tripod socket of a camera;

said support being pivotally mounted on said frame about a predetermined axis of rotation, to permit a camera on said support to be turned 90° from the horizontal to the vertical;

a palm pad mounted on said frame so it lies under the lens barrel of a camera which is mounted on said camera support, said palm pad positioned so that a hand which receives the palm pad in its palm, can also reach up with fingers of that hand to turn the lens barrel of a camera on said support to focus the lens;

said camera support being pivotally mounted on said frame to turn 90° about a predetermined axis located about 1½ inches above said tripod engaging portion, so that after turning 90° from the horizontal to the vertical, the lens barrel does not substantially shift position.

4,104,624

MICROPROCESSOR CONTROLLED CRT DISPLAY SYSTEM

Nagaharu Hamada, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 28, 1976, Ser. No. 754,997
Claims priority, application Japan, Dec. 29, 1975, 50-158480
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—324 AD **4 Claims**

1. A display system comprising:

a refresh memory unit having a memory unit in which at least a screen of display data is divided into a plurality of memory blocks each consisting of a byte;

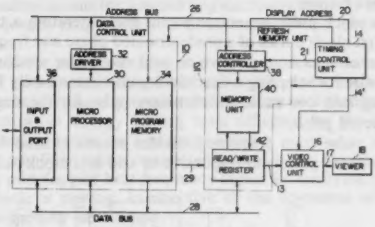
a data control unit for microprogram-controlling byte-by-byte exchange of the data between said memory unit and an external data source;

a timing control unit for controlling the timing of the data exhange and display;

an address controller provided in said refresh memory unit for selectively controlling the access to said memory unit by said data control unit to access a memory block and the

access to said memory unit by said timing control unit to simultaneously access a plurality of memory blocks;

a video control unit for generating a video signal for display based on the display data in which one character is represented by a plurality of bytes and the display timing signal; and

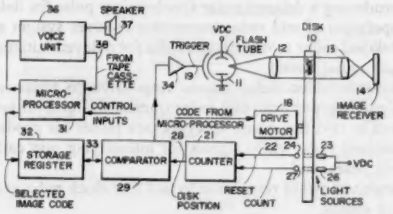


a viewer for displaying the video signal on a CRT screen as a visible image.

4,104,625
APPARATUS FOR PROVIDING FACIAL IMAGE ANIMATION

Stephen D. Bristow, Los Altos Hills, and Nolan K. Bushnell, Woodside, both of Calif., assignors to Atari, Inc., Sunnyvale, Calif.

Filed Jan. 12, 1977, Ser. No. 758,714
Int. Cl.[2] G06K *15/18*
U.S. Cl. 340—324 R **7 Claims**



1. Apparatus for providing facial image animation comprising: a plurality of image forming units each with at least a portion of a facial expression corresponding to a spoken phoneme; means for visually displaying images received from said forming units; and means for selectively activating different pluralities of said image forming units in any of a plurality of different orders to provide correspondingly different facial expression sequences.

4,104,626
ARRANGEMENT UTILIZING THE MECHANISM OF CHARGE SPREADING TO PROVIDE AN AC PLASMA PANEL WITH SHIFTING CAPABILITY

Peter Dinh-Tuan Ngo, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 9, 1977, Ser. No. 767,143
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—324 M **15 Claims**

1. A gas discharge display system comprising

at least a first row of at least first through fourth adjacent gas discharge display sites having ON and OFF states, each site comprising a volume of gas having an associated breakdown voltage V_b and each adapted to store voltages across said volume of gas,

sustain means for repetitively applying first- and second-polarity sustain signals of predetermined duration and magnitude $V_s < V_b$ alternately across each of said sites, said sustain signals causing a characteristic voltage of magnitude $V_m > (V_b - V_s)$ to be stored across a site which is in said ON state, a spread voltage $V_{ms} < (V_b - V_s)$ being stored across a site which is in said OFF state if it is immediately adjacent in said row to a site which is in said ON state,

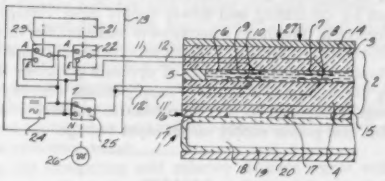
erase means for applying an erase signal across said first and third sites during first and second time intervals, respectively, each of said intervals being intermediate a respective one of said second-polarity sustain signals and the immediately succeeding, first-polarity sustain signal, and

shifting write means for applying a shifting write signal across said second and fourth sites during said first and second intervals, respectively, said shifting write signal being of said first polarity and having a magnitude V_{sw}, $(V_b - V_{ms}) < V_{sw} < V_b$.

4,104,627
DIGITALE, AN INDICATING DEVICE CONTAINING LIQUID CRYSTALS

Oscar W. Thuler, Bern, Switzerland, assignor to Merz & Bentili Nuklear AG, Bern, Switzerland

Filed May 2, 1975, Ser. No. 573,930
Claims priority, application Switzerland, May 3, 1974, 6082/74
Int. Cl.[2] G02F *1/13*
U.S. Cl. 340—336 **15 Claims**



1. A digital indicating device comprising:

a liquid crystal cell having first and second planar, approximately parallel, spaced-apart faces between which a liquid crystal showing optical rotary power is disposed, and a plurality of light transmissive, electrically conductive electrode pairs on opposite sides of the liquid crystal corresponding to character regions to be displayed, the first face of the cell being exposed to ambient light;

first and second light polarizing means having directions of polarization at right angles to each other, the first and

second light polarizing means being disposed adjacent to opposite sides of the liquid crystal cell parallel to the first and second planar faces thereof, respectively;

light emitting means disposed adjacent to the second polarizing means on the side thereof opposite the second face of the cell to direct light through the cell toward the first face;

a reflector disposed between the light emitting means and the second polarizing means, the reflector being light transmissive on the areas corresponding to the character regions;

means for generating electrical control signals corresponding to the different characters to be displayed to impress an electrical potential difference across certain combinations of the electrode pairs to deactivate the liquid crystal between such electrode pairs;

first means responsive to the control signals for displaying the corresponding characters as dark characters on a light background at the first face of the cell in the presence of ambient light incident upon the first face of the cell; and

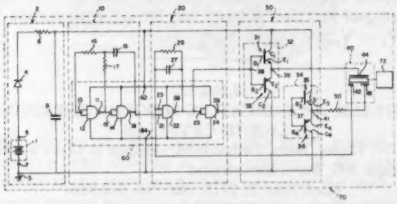
second means responsive to the control signals for displaying the same corresponding characters as light characters on a dark background at the first face of the cell in the absence of ambient light incident upon the first face of the cell.

4,104,628

HIGH OUTPUT AUDIBLE ALARM DEVICE UTILIZING A PIEZOELECTRIC TRANSDUCER AND VOLTAGE DOUBLING MEANS

Louis P. Sweany, Carmel, and Michael T. Burk, Indianapolis, both of Ind., assignors to P.R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Oct. 15, 1976, Ser. No. 732,884
Int. Cl.[2] G08B 3/00
U.S. Cl. 340—384 E **6 Claims**



1. In a high output audible alarm device comprising a power supply means, a pulsator means responsive to said power supply means for producing pulsations in said audible alarm device, an amplifier means electrically coupled to said pulsator means for oscillating said power supply input voltage, and a piezoelectric transducer responsive to said amplifier means, the improvement comprising a means simultaneously responsive to a plurality of electrical pulses of opposite polarities for doubling the voltage of said power supply means whereby a drive voltage is supplied to said piezoelectric transducer which is double said power supply means input voltage.

4,104,629

MARINE RADAR INTERROGATOR-TRANSPONDER TARGET DETECTION, IDENTIFICATION, AND RANGE MEASUREMENT SYSTEM

Eric J. Isbister, Greenlawn, N.Y., and Horace E. Fidler, Charlottesville, Va., assignors to Sperry Rand Corporation, New York, N.Y.

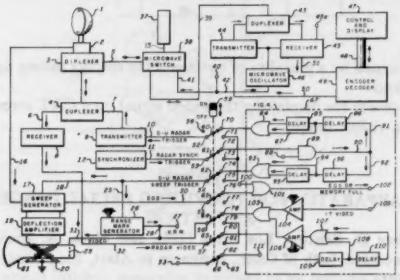
Filed Aug. 13, 1976, Ser. No. 714,211
Int. Cl.[2] G01S 9/56
U.S. Cl. 343—6 R **85 Claims**

1. In a radio aid to navigation adapted for cooperative use with an azimuth scanning radar transmitter-receiver system wherein a radar echo signal is represented by intensification of a cathode ray beam of radar indicator means, said radio system including synchronizer means for generating at least one synchronizer pulse for initiating a radial sweep of said cathode ray beam and for initiating operation of said radar transmitter-receiver system:

first clock pulse generator means for generating a train of first clock pulses of a predetermined phase and frequency,

selector means responsive to said one radar synchronizer pulse for selecting a first clock pulse immediately following said one radar synchronizer pulse for forming a selected pulse,

first pulse train frequency divider means cleared by said selected pulse and responsive to said first clock pulses for



initiating trains of second clock pulses of first and second phase and of a second predetermined pulse frequency,

first counter-decoder means cleared by said selected pulse and responsive to said first phase second clock pulses for producing a delayed radar synchronizer pulse for delayed operation of said radar transmitter-receiver system and a delayed radar sweep trigger pulse for delayed initiation of said radial sweep,

adjustable video delay means responsive to radar video signals output from said radar transmitter-receiver system and to said first phase second clock pulses for producing delayed radar video signals for intensifying said cathode ray beam, and

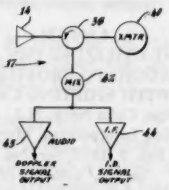
transceiver means responsive to said first clock pulse generator means.

4,104,630

VEHICLE IDENTIFICATION SYSTEM, USING MICROWAVES

Norman E. Chasek, 24 Briar Brae Rd., Stamford, Conn. 06903

Filed Jun. 21, 1976, Ser. No. 698,468
Int. Cl.[2] G01S 9/56
U.S. Cl. 343—6.5 R **12 Claims**



11. A vehicle identification system comprising:

tuned reflective means adapted to be mounted on a vehicle for directionally reflecting microwave energy in a predetermined frequency range,

transponder means adapted to be mounted on the vehicle comprising an antenna tuned to said predetermined frequency range, a digital coder, and a transponder circuit

interconnecting said antenna and said coder for transmitting a coded signal upon reception by said antenna of microwave energy in said predetermined frequency range,

an interrogating station including directional antenna means adapted to be aimed at a passing vehicle,

transmitter means for transmitting microwave energy in said frequency range from said directional antenna means,

a mixer,

a circulator interconnecting said directional antenna means and said transmitter and said mixer for producing a doppler beat frequency signal resulting from such transmitted microwave energy having been reflected by the tuned reflective means on a passing vehicle,

audio amplifier means connected to said mixer for amplifying said doppler beat frequency signal for verifying that a vehicle is passing, irrespective of the operation of said transponder means, and

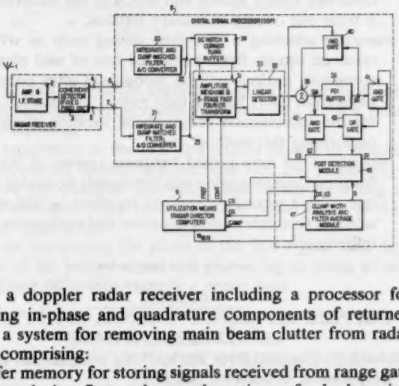
said interrogating station also including intermediate frequency amplifier means for amplifying a coded intermediate frequency signal resulting from transmission of a coded signal by said transponder means for vehicle identification.

4,104,631

METHOD AND SYSTEM FOR CLUTTER BLANKING IN A RADAR TARGET PROCESSOR

Wayne L. Weigle, Ellicott City; Edgar L. Fogle, Severna Park; Oscar M. Cromer, Baltimore, and Larry C. Schafer, Glen Burnie, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 1, 1976, Ser. No. 672,823
Int. Cl.² G01S 7/44
U.S. Cl. 343—7 A **7 Claims**



1. In a doppler radar receiver including a processor for producing in-phase and quadrature components of returned signals, a system for removing main beam clutter from radar returns comprising:

a buffer memory for storing signals received from range gate filters during first and second portions of a look period and for providing a first and a second digital data signal representative of the signals stored during the respective first and second portions of the look period;

processing means operatively connected to said buffer memory for successively processing the first and second data signals from said buffer memory in accordance with a radar processing algorithm to provide respective first and second data matrices representing return signal amplitude as a function of range for a plurality of doppler frequencies;

means for summing the data matrices from said processing means for two different halflook periods;

a post detection module;

gating and synchronizing means coupled to said summing means for establishing a clutter processing period corresponding to the first portion of the next look period, and a target processing period corresponding to a second portion of a next look period, said gating and synchronizing means supplying to said post detection module during said clutter processing period an output indicative of the first data signal, and said gating and synchronizing means supplying to said post detection module during said target processing period an output indicative of the sum of the first and second data signals;

said post detection module including an amplitude channel for selecting the largest amplitude from range gate filters and a threshold channel for summing values of a data signal and said post detection module further including means for comparing the outputs of said amplitude channel and said threshold channel,

whereby said post detection module provides outputs indicative of the location of main beam clutter in the doppler frequency domain,

means for storing the outputs of said post detection module, and

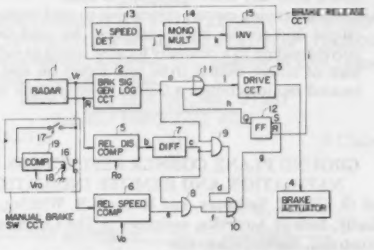
means coupling the stored outputs of said post detection module to said gating and synchronizing means for inhibiting inputs, to said post detection module during said target processing period, whereby main beam clutter is blanked from radar returns.

4,104,632

SYSTEM FOR PREVENTING COLLISION OF VEHICLES

Norio Fujiki, Yokohama, and Hiroshi Endo, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 9, 1976, Ser. No. 740,215
Claims priority, application Japan, Nov. 10, 1975, 50/134116
Int. Cl.² G01S 9/02
U.S. Cl. 343—7 VM **7 Claims**



1. An anti-crash system for a vehicle comprising:

a brake actuator of said vehicle;

a radar system mounted on said vehicle for generating a relative speed signal representative of a relative speed between said vehicle and an obstacle in front of said vehicle and a relative distance signal representative of a relative distance between said vehicle and said obstacle;

a brake signal-generating logic circuit connected to said radar system for producing a brake signal in response to said relative speed and relative distance signals;

means for comparing said relative speed signal with a first predetermined reference value and for producing a higher speed signal when said relative speed signal exceeds said first reference value;

means for comparing said relative distance signal with a second predetermined reference value and for producing a blind zone signal when said relative distance signal is lower than said second reference value;

means connected for receiving said blind zone signal and said higher speed signal and for generating a first holding signal when receiving both said blind zone signal and said higher speed signal;

means connected for receiving said braking signal and said blind zone signal and for generating a second holding signal when receiving both said braking signal and said blind zone signal;

means for generating a brake holding signal in response to either one of said first and second holding signals; and

means for driving said brake actuator in response to either one of said braking signal or said brake holding signal.

4,104,633

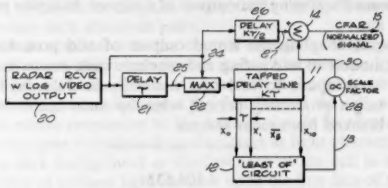
EXTENDED TARGET-LOG CFAR PROCESSOR

Thomas H. Donahue, Glendale, and John F. Chaney, West Covina, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 18, 1977, Ser. No. 788,134

Int. Cl.[2] G01S *7/02*

U.S. Cl. 343—7 A **12 Claims**



1. A CFAR radar video signal processor comprising:

first means including at least one delay line responsive to said radar video signal and having a predetermined plurality of outputs spaced in time by one range cell of the radar system in which said CFAR processor is being used;

second means including a least of circuit connected to provide an output corresponding to the least of the signals extant on any of said first means outputs except a predetermined centrally located output, in time;

and a differencing circuit responsive to said least of circuit output and to the signal provided by said first means corresponding to a centrally located signal to subtract said least of circuit output from said signal on said centrally located tap to produce a CFAR video output signal.

4,104,634

GROUND PLANE CORNER REFLECTORS FOR NAVIGATION AND REMOTE INDICATION

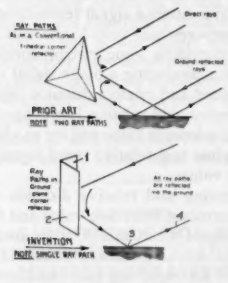
Paul O. Gillard, Salisbury, and Kenneth B. Whiting, Tea Tree Gully, both of Australia, assignors to The Commonwealth of Australia, Parkes, Australia

Continuation of Ser. No. 536,617, Dec. 26, 1974, abandoned. This application Nov. 30, 1976, Ser. No. 746,152

Claims priority, application Australia, Jan. 3, 1974, PB6147

Int. Cl.[2] H01Q *15/00, 15/14*

U.S. Cl. 343—18 C **16 Claims**



1. In a system including a trihedral reflector for reflecting a sonar or radar signal, an arrangement comprising dihedral plates normal to each other and to the earth's reflecting surface to form with the earth's natural reflecting surface a trihedral reflector, the earth's natural surface extending ahead of and beyond the confines of the dihedral plates at elevation angles including angles below the Brewster angle, the signal being reflected once each by the two reflecting surfaces of said dihedral plate and the earth's surface in any order whereby normal and circularly polarized radar transmission is achieved.

4,104,635

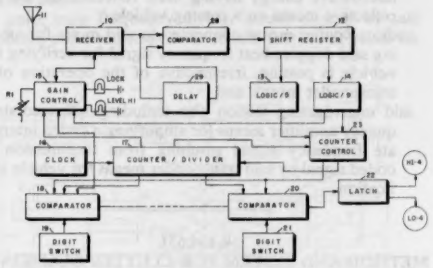
LORAN-C NAVIGATION APPARATUS

Lester R. Brodeur, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Nov. 12, 1976, Ser. No. 741,268

Int. Cl.[2] G01S *1/24, 1/30*

U.S. Cl. 343—103 **26 Claims**



22. A method of deriving position information for navigation purposes by making measurements of the time period between receipt of signals from a first or master transmitting station and selected ones of a plurality of secondary transmitting stations in a navigation system comprising steps of,

checking signals received from said master and said secondary stations to determine which of the received signals is from said master station and which of the received signals is from one of said secondary stations,

manually selecting a first time period only in which the received signals from a selected one of said plurality of secondary stations will be recognized after consulting a navigation chart having time period information thereon for the approximate geographical location of equipment performing this method, and

measuring the time period between receipt of the signals from said master station and the signals from said selected one of said secondary stations received in said manually selected first time period to derive said navigation position information.

4,104,636

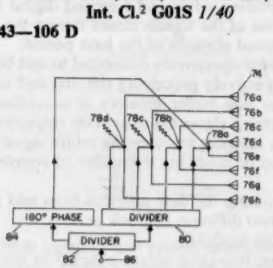
DOPPLER REFERENCE ANTENNA WITH PHASED CENTERLINE EMPHASIS

Richard F. Frazita, Deer Park, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,064

Int. Cl.[2] G01S *1/40*

U.S. Cl. 343—106 D **14 Claims**



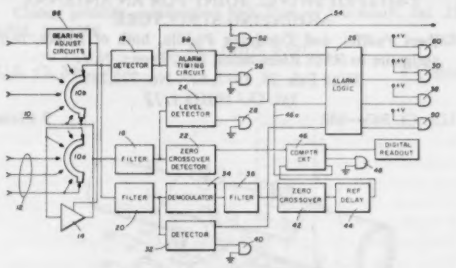
10. In a Doppler navigation system wherein a ground station uses a reference antenna to radiate a reference frequency signal into an angular region of space and a coding antenna to radiate

a frequency coded signal into said region during first and second time intervals, said coded signal having a first frequency offset from said reference signal and a first angular frequency variation during said first time interval and an opposite frequency offset and an opposite angular frequency variation during said second time interval, and wherein a mobile receiver determines its angular location by comparison of the frequency of said reference and coded signals during said first and second time intervals, the improvement wherein said reference antenna has a first radiation mode during said first time interval and a second radiation mode during said second time interval, said second mode having a phase between the radiation in a selected angular direction in said region and the radiation in the remainder of said region which is different than said phase for said first mode.

4,104,637
VOR PHASE MONITORING SYSTEM

David R. Nielson, Sandy, Utah, assignor to E-Systems, Inc., Dallas, Tex.

Filed Oct. 27, 1976, Ser. No. 735,947
Int. Cl.[2] G01S *1/44;* H04B *1/06*
U.S. Cl. 343—106 R **13 Claims**



9. An aircraft navigation receiver monitor where first and second signals of given frequency are received from a field station, comprising:

means responsive to the first and second signals to change the frequency thereof and generate first and second signals at the changed frequency, said means including a programmable delay to introduce a phase delay to the second signal, and

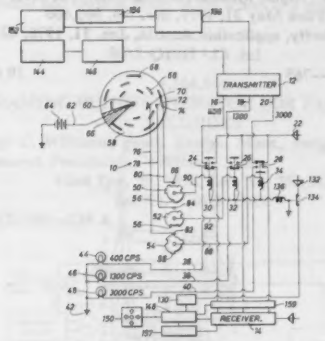
means for comparing the phase of the first signal with the phase of the second signal and generating an alarm when the phase difference exceeds a preset limit.

4,104,638
COOPERATIVE TYPE ANTI-COLLISION RADIO SYSTEM

Raymond R. Middleton, 1203 W. 16th St., Topeka, Kans. 66604

Filed Jun. 23, 1976, Ser. No. 699,019
Int. Cl.[2] G08G *5/04*
U.S. Cl. 343—112 CA **13 Claims**

1. An aircraft anti-collision radio system for sending and receiving radio transmissions on the same radio frequency, said system comprising radio transmitter circuitry continuously transmitting radio signals of at least one designated tone, radio receiver circuitry continuously receiving said radio signals of said designated tone, transmitting and receiving antenna circuitry means for said system, indicator circuitry means capable of being energized upon receiving radio signals of said designated tone through said receiver circuitry, switching circuitry means for selectively completing the circuitry between said transmitter circuitry and said antenna circuitry means in a first operative condition thereof whereby radio signals of said designated tone are transmitted from said antenna circuitry means and completing the circuitry between said receiver circuitry and said indicator circuitry means in a second operative condition thereof for receiving radio signals transmitted from other aircraft, means for sequentially actuating said switching circuitry means to said first and second positions thereof in response to a coded sequence that is different in said radio system from the coded sequence of all other aircraft having a similar



anti-collision radio system, whereby said radio system is capable of intermittently transmitting and receiving radio signals of said designated tone through said transmitting and receiving antenna circuitry means.

4,104,639
ANTENNA FORMED OF TWO CLOSELY COUPLED LINEAR CONDUCTORS WITH HELICAL TOP LOADING

Jerome J. Muchiarone, Anderson, S.C., assignor to True Temper Corporation, Cleveland, Ohio

Filed Oct. 4, 1976, Ser. No. 727,861
Int. Cl.[2] H01Q *1/32, 9/36*
U.S. Cl. 343—723 **9 Claims**

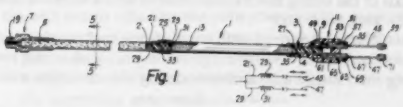


Fig. 1

1. A radio frequency antenna comprising:

an elongated shaft of dielectric material, said shaft having a base end, a tip end, and an exterior surface between the base and tip ends; and

first and second electrical conducting means electrically connected to each other at the base end of the antenna and electrically insulated from each other at the tip end of the antenna, said conducting means comprising:

first and second generally linear conductors electrically insulated from each other and extending along opposite sides of the exterior surface of a first portion of the shaft; and

first and second conducting coils electrically insulated from each other and extending around the exterior surface of a second portion of the shaft, said first and second coils being electrically connected to said first and second linear conductors, respectively, to form said first and second conducting means; and

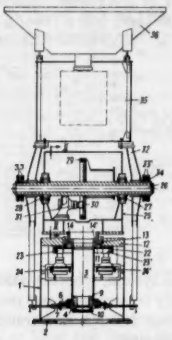
first tuning means electrically connected to one of said first and second conducting means, said first tuning means being selectively movable relative to said one conducting means for changing the resonant frequency of the antenna.

4,104,640

STEERABLE ANTENNA ARRANGEMENT

Gerhard Trauner, and Michael Kiripolszki, both of Vienna, Austria, assignors to Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed May 31, 1977, Ser. No. 801,600
Claims priority, application Austria, Jun. 11, 1976, 4253/76
Int. Cl.[2] H01Q 3/08
U.S. Cl. 343—765 **10 Claims**



1. In a steerable antenna arrangement of the type including a stator, a king post with an upper end, a lower end, rotatable around an azimuth axis and arranged in the stator, a rotating mechanism mounted on the king post, a four-point bearing accommodating the upper end of the king post, a tilting mechanism mounted on a horizontal elevation axis in the rotating mechanism, and an antenna carried by said tilting mechanism, the improvement comprising in combination:

a. a cylindrical roller bearing with a conical inner race arranged in the stator and accommodating the lower end of the king post without play,

b. a running plane of the four-point bearing which is adjustable to the azimuth axis of the king post and fixable,

c. adjustment means provided between the king post and the rotating mechanism for adjusting and fixing the elevation axis of the tilting mechanism relative to the azimuth axis of the king post, and

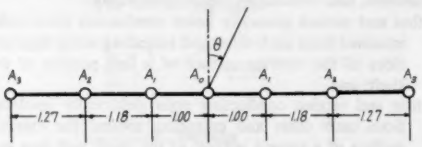
d. anti-friction bearings with equal play, equal running out of true and equal installation position provided in the rotating mechanism and accommodating the elevation axis.

4,104,641

NONUNIFORMLY OPTIMALLY SPACED ARRAY WITH SPECIFIED SIDELOBE POSITIONS IN THE RADIATION PATTERN

Hillel Unz, c/o EE Dept. Kansas Univ., Lawrence, Kans. 66045

Filed Jan. 31, 1977, Ser. No. 764,410
Int. Cl.[2] H01Q 21/08
U.S. Cl. 343—844 **10 Claims**



1. A method of synthesis for controlling the radiation pattern of a linear symmetric nonuniformly spaced array with nonuniform amplitudes by specifying explicitly the sidelobe positions (directions) in the array radiation pattern, said method based on the following rigorous relationship which expresses the array radiation pattern $F(u)$ of a symmetric nonuniformly spaced array of (2N) or (2N+1) elements by a constant plus a determinant of N rows and N columns, with the first row of the determinant consisting of N terms $(1/x_p)\cos(x_p u)$, and each subsequent row consisting of N terms $\sin(x_p v_s)$, with v_s being identical in all the terms of each row and represents explicitly the position (direction) of the corresponding sidelobe so specified in the array radiation pattern $F(u)$, the total number of sidelobe positions (directions) so explicitly specified is equal to (N−1), where one has a total of 2(N−1) sidelobe positions (directions) explicitly specified in the symmetric radiation pattern $F(u)$ of the symmetric nonuniformly spaced array of (2N) or (2N+1) elements, where $u = \pi \sin \theta$, with θ being the angle with the normal to the array axis, x_p is the distance of the p-th array element in terms of half wavelength ($\lambda/2$) from the center of the symmetric array, with only the elements of one side of the symmetric array to be used as terms in the above mentioned determinant,

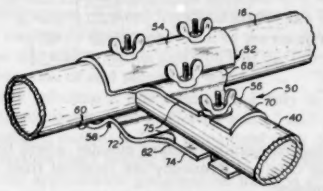
A_p is the amplitude of each element of the symmetric array to be found by developing the above mentioned determinant along its first row and identifying the amplitude of each element at position x_p as the factor multiplying the corresponding term $\cos(x_p u)$.

4,104,642

T-SHAPED SWIVEL JOINT FOR AN ANTENNA MOUNTING STRUCTURE

Gilbert Padilla, and Dominick Padilla, both of Bronx, N.Y., assignors to RMS Electronics, Inc., Bronx, N.Y.

Filed Feb. 25, 1977, Ser. No. 772,285
Int. Cl.[2] H01Q 1/12
U.S. Cl. 343—882 **9 Claims**



1. In an antenna window mount assembly of the type including a bracing member adapted to be secured within the frame of a window; a supporting member; and means for securing one end of the supporting member to the bracing member to secure said supporting member in outwardly extending relation from the window, the free end of said supporting member being adapted to be connected to an antenna; the improvement comprising a swivel joint for releasably securing the supporting member to the bracing member to permit said supporting member to be moved between said outwardly extending position and a swivel position in which the free end of said supporting member is in relatively close spaced relation with the window, said swivel joint comprising:

a pair of T-shaped clamps each including a base portion and a protruding portion, said clamps being disposed in spaced confronting relation to define a first sleeve between said base portions in which said bracing member is disposed, and a second sleeve between said protruding portions in which said one end of said supporting member is disposed;

means for removably securing said base portions to said bracing member;

each of said protruding portions having a hole therein, said one end of said supporting member having a thru-hole therein, said protruding portion holes being in register with said thru-hole; first bolt means extending through said registered holes for pivotally mounting said supporting member on said bracing member for movement between said outwardly extending position in which said supporting member is coaxial with said second sleeve and said swivel position in which said supporting member is non-coaxial with said second sleeve; first nut means for

engaging said first bolt means and securing said supporting member in said second sleeve;

at least one of said protruding portions having a first slot extending inwardly from an axially extending edge thereof, said one end of said supporting member having an additional hole therein, said first slot being registerable with said additional hole when said supporting member is coaxial with said second sleeve; second bolt means extendable through said first slot and said additional hole when said first slot and said additional hole are registered; second nut means for engaging said second bolt means for releasably securing said supporting member in said coaxial position, the loosening of said first and second nut and bolt means permitting said second bolt means to be disengaged from said first slot, and allowing said protruding portions to be sufficiently separated to accommodate movement of said supporting member between said protruding portions toward said non-coaxial position.

4,104,643

ECHO-SOUNDING RECORDER WITH DIFFERENT DEPTH-MEASURING RANGES

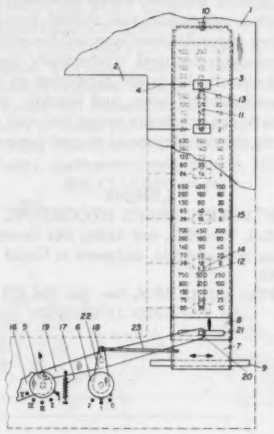
Dieter Block, Kiel, Germany, assignor to Electroacustic GmbH, Germany

Filed Jul. 20, 1977, Ser. No. 817,489

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1976, 2632799

Int. Cl.[2] G01D *9/00*

U.S. Cl. 346—17 **4 Claims**



1. In an echo-sounding recorder wherein received echoes are recorded on a common recording surface, starting from a common zero mark, by means of a recording member moving with uniform velocity, the echo-sounding recorder being switchable to different depth-measuring ranges, respective switching members operable independently of one another for setting the recorder to different main measuring ranges and to different offset measuring ranges, and a scale associated with each of the measuring ranges, the improvement therein comprising a scale carrier carrying all of the scales in a common plane, said scale carrier being formed of at least two parts respectively displaceable vertically and horizontally relative to one another, a cover plate disposed in front of said scale carrier parallel to the recorder and formed with a row of windows spaced from one another a distance corresponding to the distance between divisions of the respective scales, said scale carrier being mounted for movement relative to said cover plate in two mutually perpendicular directions disposed in the common plane of the scales over a distance corresponding to the scale offset, and kinematic transmission means for coupling said scale carrier to the switching members so that actuation of one of the switching members moves the scale carrier in one of said mutually perpendicular directions, and actuation of the other of the switching members moves the scale carrier in the other of said mutually perpendicular directions, each of the movements of the scale carrier being equal to the respective horizontal and vertical offset of the scales or a multiple thereof.

4,104,644

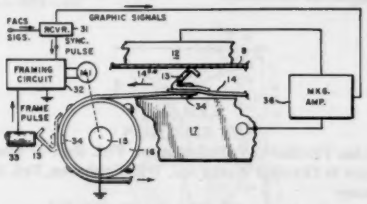
FRAMING PULSE GENERATOR FOR FACSIMILE RECORDER

George C. Williams, South Easton, Mass., assignor to Alden Research Foundation, Westboro, Mass.

Filed Dec. 29, 1976, Ser. No. 755,342

Int. Cl.[2] G01D *15/06*

U.S. Cl. 346—139 A **4 Claims**



1. Facsimile recording apparatus for electrically marking graphic signals line by line on a recording web, each line of graphic signals being preceded by a syncronization pulse, said apparatus comprising:

an assembly defining an elongate scanning zone through which the web is fed;

a belt carrying at least one conductive stylus and conveying the stylus along the zone across the web to mark signals on the web;

a conductive pulley at one end of the scanning zone interengaging with the belt, the belt including conductive means electrically connected to the stylus and making electrical contact with the pulley;

means for driving the belt;

contact means adjacent the pulley beyond the scanning zone in the path of the stylus so that the stylus completes a pulse generating circuit through the pulley and contact means for each scan of the zone before the stylus is conveyed into the recording zone; and

a framing circuit connected to the contact means for receiving the generated pulse and controlling the belt driving means thereby to frame the graphic signals on the recording web.

4,104,645

COINCIDENCE INK JET

Kenneth H. Fischbeck, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.

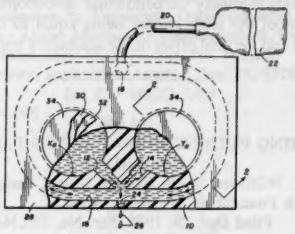
Continuation-in-part of Ser. No. 625,988, Oct. 28, 1975, abandoned. This application Oct. 12, 1976, Ser. No. 731,407

Int. Cl.[2] G01D *15/18*

U.S. Cl. 346—140 R **47 Claims**

1. In a multiple ink jet assembly comprising: at least two ink jets each having an outlet orifice, a first fluid chamber, first passage means communicating said first fluid chamber with the orifice of one of said jets, a second fluid chamber, second passage means communicating said second fluid chamber with each of the orifices of said jets, liquid in said first and second fluid chambers and each of said passage means, means for independently decreasing the volume of each of said first and second fluid chambers to generate pressure pulses therefrom,

and means for effecting coincidently only at the orifice of said one jet the pressure pulse generated by said first chamber and



the pressure pulse generated by said second chamber to express a liquid droplet therefrom.

4,104,646

INK EJECTION

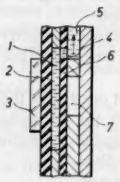
Karl-Heinz Fischbeck, Wilhelmshaven, Fed. Rep. of Germany, assignor to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Dec. 10, 1976, Ser. No. 749,518

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1975, 2555749

Int. Cl.[2] G01D *15/16*; B41J *3/04*

U.S. Cl. 346—140 R **4 Claims**



1. An arrangement comprising, in combination:

(a) an ink ejector head having an ink flow system incorporating

(1) means forming a chamber capable of being supplied with ink from an ink reservoir and having a nozzle through which ink is ejected, and

(2) a pressure producer capable of being subjected to pulses for applying pressure to the ink in said chamber so as to cause the ink to be ejected through said nozzle, said pressure producer being a ceramic oscillator comprising a ceramic oscillator element and first and second membranes, said second membrane being arranged in said ejector head and being spaced from said first membrane so as to divide the interior of said ejector head into an air chamber and an ink chamber; and

(b) means for applying to said pressure producer a series of pulses consisting of alternating primary and secondary pulses of which only said primary pulses are pulses which cause the ink to be ejected through said nozzle, said secondary pulses occurring a predetermined time interval after the cessation of the application of the immediately preceding primary pulse and being pulses for counteracting the outside air pressure and preventing the entry of a column of air into said nozzle above the returning stream of ink when there is a pressure reduction in the ejection system, said secondary pulses being applied while said oscillator is at rest.

4,104,647

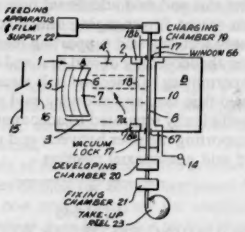
APPARATUS WITH TWO VACUUM CHAMBERS FOR ELECTROPHOTOGRAPHY PRODUCING IMAGE BY ELECTRICAL CHARGES

Edward Emanuel Sheldon, 30 E. 40 St., New York, N.Y. 10016

Filed Dec. 27, 1976, Ser. No. 754,405

Int. Cl.[2] G03G *15/044*

U.S. Cl. 346—158 **20 Claims**



1. A vacuum tube containing a first vacuum compartment and a second vacuum compartment, said first vacuum compartment comprising means for producing a beam of electrons, accelerating electrodes means for said electron beam, and an imperforate membrane mounted in the path of said electron beam, said membrane transmitting said accelerated beam of electrons and impervious to ions of energy below 25 KV, said membrane separating said first vacuum compartment from said second vacuum compartment, said second vacuum compartment comprising means for receiving said transmitted beam of electrons, producing electrical conductivity changes in response to said electron beam and producing an image corresponding to said electron beam, and window means for the passage of said image producing means into said second compartment and to the outside of said second compartment.

4,104,648

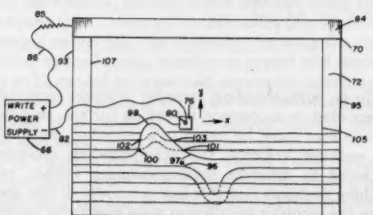
ELECTRIC SPARK RECORDING

John Blumenthal, Wickliffe, and Arling Dix Brown, Jr., Cleveland Heights, both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Jul. 12, 1976, Ser. No. 704,373

Int. Cl.[2] G01D *15/08, 9/32*

U.S. Cl. 346—163 **2 Claims**



1. In a method for providing a two-dimensional graphic display of a three-dimensional surface of an object, the method having the steps of drawing a micro-stylus transducer sequentially over the surface along a first plurality of spaced, horizontal scan lines while simultaneously measuring movement of the micro-stylus in the vertical direction orthogonal to the direction of the scan lines, the improvement comprising:

providing an arc erodable, electrically conductive recording medium having a recording surface;

applying an electrical potential to said medium along a first boundary thereof;

providing an electrically conductive writing stylus;

applying a different electrical potential to said writing stylus so that a writing potential is developed between said writing stylus and said medium;

scanning said writing stylus sequentially across said medium along a further plurality of horizontal scan lines corresponding to said first plurality of horizontal scan lines, said scanning beginning from a second boundary of said medium spaced from said first boundary, so that each one of said further plurality of scan lines is spaced from said first boundary and is closer to said first boundary than the previous scan line; and

during each sequential scan of said writing stylus across said medium, displacing said writing stylus in the horizontal direction orthogonal to the direction of said scan line by an amount proportional to movement measured by the micro stylus in the vertical direction on the surface of the object,

whereby each scan of said writing stylus arc erodes said recording medium to produce a record trace, thereby providing an open circuit between said first boundary and the portion of said medium opposite said record trace from said first boundary; and thereby further preventing the record trace produced during one scan of said writing stylus from overwriting the record trace produced by the previous scan.

4,104,649

ADAPTOR FOR PROVIDING A DIGITAL SIGNAL INDICATING THE FULL OPEN F NUMBER OF AN INTERCHANGEABLE PHOTO-TAKING LENS IN A SINGLE LENS REFLEX CAMERA SYSTEM

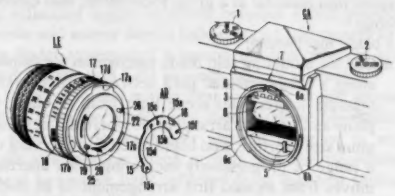
Katsumi Tanaka, Kawasaki; Shigeru Hashimoto, Yokohama; Shohei Ohtaki, Yokohama; Tadashi Ito, Yokohama; Tomonori Iwashita, Fuchu, and Susumu Kozuki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1976, Ser. No. 739,119

Claims priority, application Japan, Nov. 6, 1975, 50-133306

Int. Cl.[2] G03B *17/00*

U.S. Cl. 354—289 **17 Claims**



1. An adaptor for extablising the use of a conventional interchangeable photographic lens in combination with a digitalized camera body which is provided with an inputting device for inputting the full open F number information of said photographic lens as a coded digital signal of n-bits, said adaptor comprising:

supporting means attachable to said photographic lens in rigidly secured relation at a predetermined position; and

k-signal members, wherein k represents an integer from 0 to n inclusive, for providing said full open F number information of the photographic lens as the coded digital signal of said *n*-bits, said signal members being disposed on said supporting means and having n setting positions on the supporting means and being able to provide 2^n different digital signals corresponding to 2^n different combinations of positions of said signal members, and being adapted to actuate said inputting device of the camera body for inputting the full open F number information of the photographic lens as the coded digital signal of said n-bits when the photographic lens is mounted on the camera body, whereby it is made possible to use a conventional interchangeable photographic lens in combination with a digitalized camera body.

4,104,650

SHARP FOCUS DETECTING SYSTEM

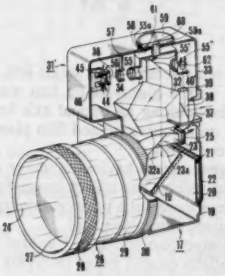
Kazuya Hosoe, Machida; Seiichi Matsumoto; Shigeru Hashimoto, both of Yokohama; Tomonori Iwashita, Chofu; Tadahide Fukushima, and Hideo Yokota, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 14, 1975, Ser. No. 604,535

Claims priority, application Japan, Aug. 16, 1974, 49-94369; Aug. 20, 1974, 49-95167; Aug. 20, 1974, 49-95168; Aug. 30, 1974, 49-100154

Int. Cl.[2] G03B *7/08*

U.S. Cl. 354—25 **26 Claims**



1. A focus detecting system for use with an optical instrument, comprising:

(a) an image-forming lens system mounted on said optical instrument and arranged to be adjustable so that an image of an object is formed on a focal plane of said optical instrument, said lens system being interchangeable with another image-forming lens system having different imaging performance;

(b) a housing adapted to be attachable to and detachable from said optical instrument;

(c) sensing means mounted in said housing and having a light sensitive image-receiving surface transversely positioned in the path of a light projected through said optical lens system, said sensing means producing an electrical output which changes in correspondence with the change in the sharpness of the object image formed on the image-receiving surface;

(d) means for periodically varying the substantial length of the light beam path between said lens system and said sensing means;

(e) circuit means mounted in said housing and electrically connected to said sensing means for processing said electrical output produced therefrom to produce an electrical signal commensurate with the focusing condition of said lens system, and

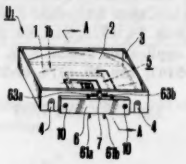
(f) compensating means mounted in said housing and arranged upon interchanging said image-forming lens system for compensating a deviation of the electrical output of the sensing means caused by the difference in the imaging performance of said image-forming lens system,

said compensation means including a plurality of lenses having different refractive powers from one another and selecting means being mounted in said housing and arranged to be operable from the outside of said housing for selecting one of said lenses in correspondence with the imaging performance of said optical lens system for cooperation with said sensing means.

4,104,651
FOCUSING SCREEN UNIT FOR SINGLE LENS REFLEX CAMERA

Seiichi Matsumoto; Mutsuhide Matsuda, both of Yokohama, and Hideo Yokota, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1977, Ser. No. 768,417
Claims priority, application Japan, Feb. 17, 1976, 51-16297
Int. Cl.[2] G03B 7/08, 17/20
U.S. Cl. 354—25 32 Claims



1. A focusing screen assembly for a single lens reflex camera which is equipped with a photo-taking lens means, said lens means being adjustable along an optical axis for focusing an image of an object on a predetermined film plane of the camera, said assembly comprising;

(a) a focusing screen means having an image receiving surface adapted to receive the object image formed by said photo-taking lens means at a position conjugate to that of said predetermined film plane; and

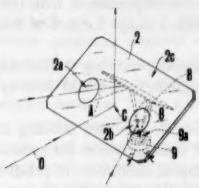
(b) light transmissive photoelectric transducing means arranged substantially on said image receiving surface of the screen means and capable of producing an electrical output substantially corresponding to the sharpness of the image on said image receiving surface as the image sharpness is varied by the axial adjustment of the lens means,

whereby it is made possible to detect the focusing condition of the lens means to the object by the electrical output of the transducing means.

4,104,652
SINGLE LENS REFLEX CAMERA

Kazuya Hosoe, and Hideo Yokota, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1977, Ser. No. 776,246
Claims priority, application Japan, Mar. 12, 1976, 51-27580
Int. Cl.[2] G03B 3/00
U.S. Cl. 354—25 13 Claims



1. A single lens reflex camera comprising:

(A) a photo-taking lens system having an optical axis and adjustable along the axis so as to form an object image on a predetermined film plane;

(B) a view finder optical system adapted for viewing the object image to be formed on the film plane by the lens system from outside the camera;

(C) a viewing mirror for deflecting an image light coming from said lens system to said view finder optical system;

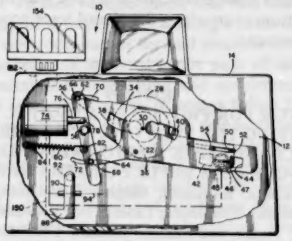
(D) an auxiliary mirror arranged behind said viewing mirror, at least one of said viewing mirror and said auxiliary mirror having a function of causing only at least one part of the image light coming through said taking lens system in an outer zone comparatively distant from a center thereof to go out from the path of the light going to the film plane; and

(E) photo-electric detecting means for detecting the focusing condition of the lens system to the object, said detecting means being arranged to receive only said image light of the outer zone through said auxiliary mirror and being responsive to said image light of the outer zone to produce a signal corresponding to the focusing condition of the lens system to the object.

4,104,653
SCANNING SHUTTER BLADE ARRANGEMENT WITH AMBIENT AND FLASH RANGES

Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 31, 1977, Ser. No. 801,477
Int. Cl.[2] G03B 7/14
U.S. Cl. 354—27 17 Claims



1. A photographic camera apparatus for use in either an ambient scene lighted mode or an artificially scene lighted mode wherein the camera includes means for mounting photographic film material at a given focal plane, said camera comprising:

a blade mechanism;

means for mounting said blade mechanism for displacement along a predetermined path between a first arrangement wherein it precludes scene light from reaching the film plane and a second arrangement wherein it defines a maximum size aperture, said blade mechanism serving to define a range of progressively increasing sized apertures as it moves from its said first arrangement to its said second arrangement;

means for detecting scene light in correspondence to the scene light admitted to the focal plane by said blade mechanism as it moves through said range of apertures between said first and second arrangements and for integrating said detected scene light to provide an output signal corresponding to a select exposure value;

selectively actuable drive means for initially displacing said blade mechanism from its said first arrangement toward its said second arrangement, and in at least one of said modes of operation for thereafter displacing said blade mechanism back toward its said first arrangement in response to said output signal from said scene light detecting and integrating means to define an exposure cycle;

and means responsive to camera operation in the ambient scene lighted mode for limiting displacement of said blade mechanism along said predetermined path to an intermediate arrangement wherein it defines an aperture size less than said maximum aperture size and responsive to camera operation in the artificially scene lighted mode for not limiting displacement of said blade mechanism along said predetermined path intermediate its said first and second

arrangements thereby providing for varying depths of field in at least said one mode of operation.

4,104,654

PHOTOMETRIC APPARATUS FOR SINGLE LENS REFLEX CAMERA

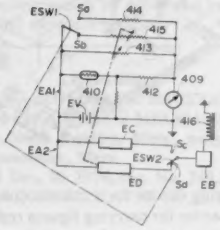
Yoshihisa Maitani; Kunio Shimoyama; Muneaki Yoshida; Akihiko Hashimoto, and Masahiro Kitagawa, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Division of Ser. No. 505,956, Sep. 13, 1974, Pat. No. 3,994,001. This application Aug. 24, 1976, Ser. No. 717,087

Claims priority, application Japan, Jul. 2, 1974, 49-75694

Int. Cl.[2] G03B 7/08

U.S. Cl. 354—31 **2 Claims**



1. A photographic camera operable in an automatic and manual mode, comprising:

means for positioning a light sensitive film along a focal plane of said camera;

first and second shutter blinds;

means for drawing said first shutter blind across said focal plane for initiating exposure of said film;

means for drawing said second shutter blind across said focal plane at the end of an exposure period for terminating exposure of said film;

a light reflecting mirror movable between a first position wherein said mirror directs light entering said camera to a view finder system and a second position wherein said mirror permits said light to reach said focal plane;

means for moving said mirror from said first to said second position upon the iniation of a shutter release operation;

a first photoelectric transducer element mounted in said camera at a location which permits said first transducer element to receive light reflected from said first shutter blind and/or said film;

a second photoelectric transducer element mounted in said camera at a location which permits said second transducer element to receive light directed by said mirror to said view finder system;

automatic exposure circuit means cooperating with said first transducer element and independent of said second transducer element for controlling the exposure time of said film as a function of the amount of light reflected from said first shutter blind and/or said film, when said camera is in an automatic mode;

meter means cooperating with said second transducer element for providing photometric information regarding the amount of light entering said camera prior to a shutter release operation, said meter means including a meter pointer and a scale, the position of said pointer relative to said scale providing said photometric information;

manual exposure circuit means cooperating with said meter pointer and said second transducer element for permitting manual adjustment of the exposure period of said film according to the information supplied by said meter means when said camera is in said manual mode.

4,104,655

CAMERA WITH AUTOMATIC EXPOSURE CONTROL SYSTEM

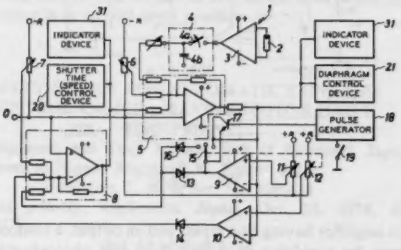
Karl-Peter Strauss, Volkmarode, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Dec. 20, 1976, Ser. No. 752,053

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1975, 2558254

Int. Cl.[2] G03B 7/08

U.S. Cl. 354—38 **15 Claims**



1. A camera comprising

(a) first factor means for preselecting a value for one of the two exposure value factors of shutter speed and diaphragm aperture and for producing a first output signal in accordance with such preselected value,

(b) light measuring circuit means for measuring brightness of a subject to be photographed and producing a second output signal in accordance with such brightness,

(c) means for setting a film sensitivity value and producing a third output signal in accordance therewith,

(d) means responsive to said first, second, and third output signals for determining an optimum value for the other of said two exposure value factors and for producing an optimum value signal in accordance therewith,

(e) means for producing range limit signals indicating an available range of values for said other of said two factors,

(f) comparator circuit means for comparing said optimum value signal with said range limit signals and producing a comparator output signal,

(g) circuit means for conveying said comparator output signal to said first output signal to influence said first output signal produced by said first factor means,

(h) gate means preventing transmission of said comparator output signal to said first output signal when said optimum value signal is within the range of said range limit signals and allowing such transmission when it is outside said range, thereby to modify said first output signal, and

(i) means responsive to said first output signal produced by said first factor means as and when modified by said comparator output signal for controlling an operating value of said first factor.

4,104,656

CONTROL MEANS FOR A DIAPHRAGM OF A SINGLE LENS REFLEX CAMERA

Karl-Peter Strauss, Volkmarode, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Continuation-in-part of Ser. No. 594,466, Jul. 9, 1975, abandoned, which is a continuation of Ser. No. 467,754, May 7, 1974, abandoned. This application Oct. 19, 1976, Ser. No. 733,770

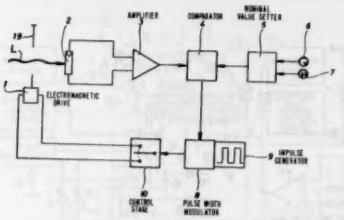
Claims priority, application Fed. Rep. of Germany, May 5, 1973, 2322747; Feb. 16, 1974, 2407600

Int. Cl.[2] G03B 7/08

U.S. Cl. 354—43 **24 Claims**

1. Control means for controlling an adjustable aperture of a

diaphragm of a photographic camers, said control means comprising electromagnetic diaphragm drive means, a photoelectric converter situated behind said diaphragm in position to receive light through the aperture of said diaphragm, exciter current supply means responsive in part to current from said photoelectric converter for supplying a succession of exciter pulses to said electromagnetic drive means to cause movement of said drive means to adjust said diaphragm to a different aperture, said exciter current supply means including an opera-



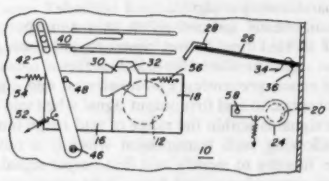
tion amplifier having two inputs and an output, a control stage, means for supplying an output from said photoelectric converter to an input of said amplifier, nominal value setting means operatively connected to influence voltage supplied to one input of said amplifier, a feedback circuit from the output of said amplifier to one input thereof, an operative connection from the output of said amplifier to an input of said control stage, and an operative connection from an output of said control stage to said electromagnetic drive means.

4,104,657

PIEZOELECTRIC ELECTRONIC SHUTTER CONTROL FOR CAMERAS

Lee Fitzpatrick Frank, and James Kelly Lee, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 18, 1977, Ser. No. 816,834
Int. Cl.² G03B *7/08, 9/62*
U.S. Cl. 354—50 **13 Claims**



1. A camera of the type having (1) an exposure aperture and (2) a shutter movable to open and close the aperture; said camera comprising:

a piezoelectric energy conversion device having an original shape;

releasable means for deforming said piezoelectric device from its original shape in a first direction to create a first electric charge tending to return said device to its original shape;

means for dissipating said first electric charge from said piezoelectric device, whereby a second electric charge tending to resist the return of said device to its original shape is created when said deforming means is released;

means for dissipating said second electric charge at a rate which is a function of the level of scene illumination; and

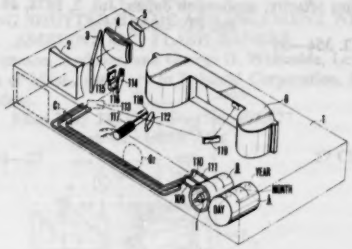
means, responsive to said second charge having dissipated to a predetermined level, for controlling movement of the shutter from its open to its closed position.

4,104,658

DATA PRINTING DEVICE FOR CAMERA

Takashi Uchiyama; Noriaki Sanada, both of Yokohama; Teruo Otaka, Kawasaki; Yoshio Komiya, Tokyo; Youichi Okuno, Yokohama, and Hideo Yokota, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 24, 1976, Ser. No. 744,462
Claims priority, application Japan, Nov. 25, 1975, 50-140880; Dec. 8, 1975, 50-146155; Dec. 17, 1975, 50-151143; Jan. 14, 1976, 51-3591
Int. Cl.² G03B *17/24*
U.S. Cl. 354—106 **4 Claims**



1. A data printing device for a camera comprising:

a data figure carrier for carrying figures representing photographing data to be inserted on a portion of photosensitive film simultaneously with a picture image being photographed;

data setting means interengaged with said data figure carrier for setting the data to be inserted on a photograph;

a light source for illuminating the data figures set by the data setting means;

optical means for guiding light flux passing through the set data figures to a film surface; and

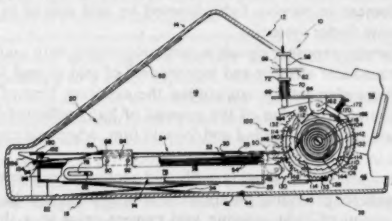
bundles of optical fibers being provided as optical means for guiding light flux supplied by said light source passing through the set data figures to an optical path of a view finder, one end of each of the optical fiber bundles facing said data figure carrier.

4,104,659

PHOTOGRAPHIC APPARATUS HAVING A SPRING DRIVEN MOTOR

Lawrence M. Douglas, South Easton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 28, 1977, Ser. No. 781,724
Int. Cl.² G03B *1/18*
U.S. Cl. 354—170 **8 Claims**



1. Photographic apparatus comprising:

means for locating a film cassette in position for exposure of a film unit contained therein;

means, extending between the exterior of said apparatus and said locating means, for defining a path along which the film cassette travels as it is manually moved toward said locating means;

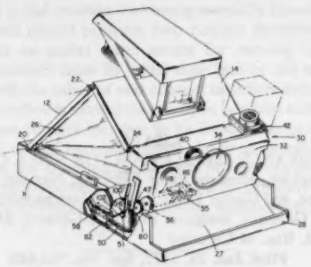
means for exposing the film unit;
means for performing a post exposure function associated with the advancement of the exposed film unit from said exposure position;
a spring motor;
means for coupling said spring motor to said performing means;
means coupled to said spring motor for winding said spring motor to increase the energy thereof, said winding means including a member located at a first position within said means for defining a path so as to be engaged and moved by the film cassette toward a second position during movement of the cassette toward said locating means, such movement of said member between said first and second positions being transmitted to said spring motor to wind the latter; and
means responsive to the actuation of said exposing means for enabling said spring motor to drive said performing means via said coupling means to move the exposed film unit away from said exposure position.

4,104,660

CAMERA HAVING AUTOMATIC SHUTTER RECOCK BY FILM PROCESSING MECHANISM

Philip R. Norris, North Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 10, 1976, Ser. No. 749,309
Int. Cl.[2] G03B *17/52, 1/18, 19/10, 17/04*
U.S. Cl. 354—171 **27 Claims**



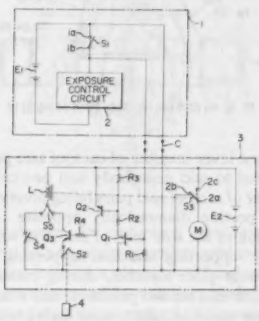
12. A camera of the type employing a removable film cartridge including a plurality of individual film units, said camera having:
a base including forward and rear portions;
a motor carried on said base;
an output gear mechanism mounted on said base in driving connection to said motor;
an access door coupled to said base forward portion for pivotal movement between an open position permitting insertion or removal of a said film cartridge and a closed position for camera operation;
a shutter mechanism housing pivotably connected to said base forward portion at a housing pivot axis for pivotal movement of said housing between an erect position for camera operation and a collapsed position for storage;
said access door closed position and said shutter mechanism housing erect position together defining a camera operating condition;
a film advance gear arrangement including a processing roll gear mounted on said access door and drivably connected with said output gear when said access door is in its said closed position, said processing roll gear having its axis forward of said door pivot axis;
shutter mechanism recock means carried in said housing and including a recock gear having its axis forward of said housing pivot axis and of said processing roll gear axis, said recock gear being drivably engaged with said processing roll gear when said camera is in its operating condition with said housing erect and said door closed, and disengaged therefrom when said housing is in its said collapsed position or said door is in its said open position;
said door pivot axis, said housing pivot axis, said processing roll gear axis, and said recock gear axis all lying in a common plane in said camera operating condition;
said recock gear being thereby smoothly pivotable into and out of engagement with said processing roll gear during said pivotal motion of said housing when said access door is in its said closed position; and
said processing roll gear being thereby smoothly pivotable into and out of engagement with said recock gear and during said pivotal motion of said access door when said housing is in its said erect position.

4,104,661

SAFETY DEVICE FOR AUTOMATIC EXPOSURE CONTROL CAMERA HAVING MOTOR DRIVE EQUIPMENT

Shiro Sugimori, and Kenji Toyoda, both of Kawasaki, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 7, 1975, Ser. No. 620,423
Claims priority, application Japan, Oct. 14, 1974, 49-122776[U]
Int. Cl.[2] G03B *1/18*
U.S. Cl. 354—173 **8 Claims**



1. In a camera having an exposure control circuit determining shutter speed or stop value for obtaining a proper exposure, an electric motor effecting shutter release, shutter charge and film winding operations when the motor is energized, and a phototaking switching means manually operable from outside the camera for energizing the motor when the phototaking switching means is closed, the improvement comprising, in combination, a main switching means making the exposure control circuit operable when the main switching means becomes conductive, an auxiliary switching means connected in series with the phototaking switching means and interlocking means which interlocks the main and auxiliary switching means to prevent the phototaking switching means from energizing the motor until the main and auxiliary switching means are both conductive.

4,104,662

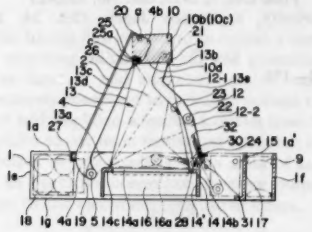
FOLDING TYPE PHOTOGRAPHIC CAMERA

Susumu Fukuda, Kobe, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sep. 16, 1976, Ser. No. 723,859
Claims priority, application Japan, Sep. 23, 1975, 50-115251
Int. Cl.[2] G03B *17/04*
U.S. Cl. 354—187 **9 Claims**

1. A photographic camera of folding type which comprises a main body of rectangular box-like configuration having a first housing section which is formed with an exposure aperture in a forward wall thereof facing a forward side of said

main body in terms of the object being photographed so as to accommodate therein a film container in such a manner that an exposure opening of the film container coincides with said exposure aperture of said first housing section and a second housing section being formed in a position adjacent to said first housing section and between said forward side and a rear side of said main body, lens supporting means having exposure means incorporated therein, a cover plate member pivotally connected, at one end thereof, to said main body in a position corresponding to said second housing section, with said exposure opening of said first housing section being located therebetween, for rotation between a first position to cover said forward side of said main body and a second position whereat said lens supporting means is held in photographing position, with the other end of said cover plate member pivotally connected to an adjacent corner portion of the side wall of said lens supporting means for covering, at said first position, said forward side of said main body into which said lens supporting means is housed, a pair of folding link levers, each pair having first and second lever members pivotally connected at their ends to each other for being folded in one direction, with one



end of the first lever member of each of said pairs being pivotally connected to said main body and one end of the second lever member of each of said pairs being pivotally connected to the corner portion diametrically opposite to said adjacent corner portion of the side wall of said lens supporting means, for pivotally supporting said lens supporting means together with said cover plate member, during rotation thereof, between said first and second positions, and a tension spring for said first lever member, said tension spring being connected at one end to said main body and at the other end to said first lever member intermediate of its ends so as to bias said first lever member into its two extreme positions and to resist movement between those positions such that said lens supporting means automatically moves during rotation of said cover plate member towards a first position from said second position and vice versa after being partially rotated out of one position and towards another, and a collapsible light-shielding bellows having one peripheral edge secured around said exposure aperture of said first housing section, and the other peripheral edge thereof around the rear face of said lens supporting means with said bellows being expanded at said second position and folded into a flat state at said first position.

4,104,663

MULTIPLE OBJECTIVE LENS CAMERA

Yasuo Yamazaki, Kawachinagano; Taizo Kawaguchi, Amagasaki, and Kazuo Kimura, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 25, 1977, Ser. No. 790,220

Claims priority, application Japan, May 12, 1976, 51-53251

Int. Cl.[2] G03B *3/00, 13/02*

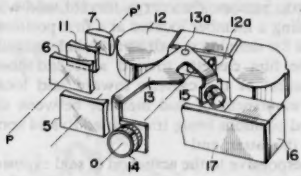
U.S. Cl. 354—197 **12 Claims**

1. A camera comprising:

a body having a lens storage space and a photographic optical axis perpendicularly incident on a focal plane in said body;

a plurality of objective lenses located in said body and selectively transferrable between advanced and retracted positions respectively in and out of registry with said optical axis for varying the camera image magnification;

a finder optical system proximate said storage space and including a field varying lens member transferrable between advanced and retracted positions respectively in and out of registry with said finder optical system, said



lens member in its retracted position occupying said lens storage space; and

operating means for selectively advancing and retracting a first of said objective lenses, said first objective lens in its retracted position occupying said storage space and in its advanced position being out of said storage space and permitting the occupation thereof by said lens member.

4,104,664

FILM ADVANCE MECHANISM FOR STILL CAMERAS

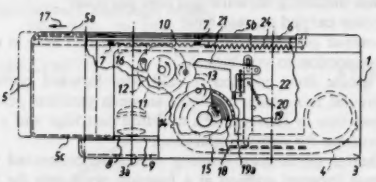
Alfred Winkler, Munich; Peter Lermann, Narring; Dieter Engelsmann, and Günter Fauth, both of Unterhaching, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, AG, Leverkusen, Fed. Rep. of Germany

Filed Jan. 28, 1977, Ser. No. 763,683

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1976, 2603661; May 14, 1976, 2621614

Int. Cl.[2] G03B *1/00, 17/04, 17/26*

U.S. Cl. 354—213 **15 Claims**



9. In a still camera having a housing a shutter and means for receiving a roll of film in said housing, a film advance device comprising, in combination, a hand operated film advance slide movable in two opposite positions, film takeup means coupled to said slide and to said film for advancing said film in one direction and for blocking the same in opposite direction; film advance control means coupled to said takeup means and to said shutter for blocking the advance of said film after a predetermined frame distance and for unblocking the film in response to the shutter actuation; and first spring means for returning and releasably arresting independently from said film advance control means said slide in a predetermined pulled-out position thereof corresponding to said frame distance.

4,104,665

CONTACT MECHANISM OF SHUTTER FOR CAMERA

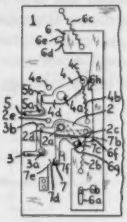
Nakagawa Tadashi; Masanori Watanabe; Eiichi Onda; Mitsuo Koyama, and Ichiro Nemoto, all of Chiba, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Nov. 24, 1976, Ser. No. 744,924

Claims priority, application Japan, Nov. 25, 1975, 50-159497[U]

Int. Cl.[2] G03B 9/08

U.S. Cl. 354—226 6 Claims



1. In a camera shutter mechanism having a shutter aperture, an opening member mounted to undergo movement from an initial position to an open position in which said shutter aperture is open and back to its initial position and being normally biased for movement to said open position, and a closing member mounted to undergo movement from an initial position to a closed position in which said shutter aperture is closed and back to its initial position and being normally biased for movement to said closed position: two contact members normally biased into an initial state; means for moving one of said contact members from its initial state into or out of electrical contact with the other of said contact members only when said opening member is moved into its open position and for returning said one contact member to its initial state in response to movement of said opening member back to its initial position; and means for effecting movement of said opening member from its open position back to its initial position during the course of movement of said closing member into its closed position.

4,104,666

EXPOSURE CONTROL CIRCUIT FOR CAMERA

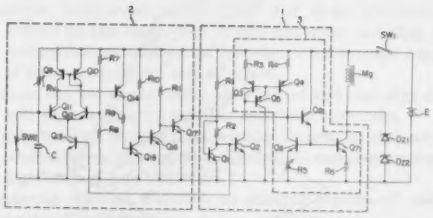
Kenji Toyoda, Kawasaki, and Sakuji Watanabe, Yono, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 9, 1976, Ser. No. 739,850

Claims priority, application Japan, Nov. 14, 1975, 50-136311

Int. Cl.[2] G03B 9/02, 9/08

U.S. Cl. 354—234 2 Claims



1. An exposure control circuit for electrically controlling a camera shutter or diaphragm, comprising:

(a) an electromagnet for actuating the shutter or diaphragm when its electromotive force has reached a predetermined value;

(b) a battery the output voltage of which varies depending on variations in its condition of use;

(c) constant current means which has for its source an output voltage of said battery, the constant current means exciting the electromagnet with constant current independently of the output voltage of said battery, as long as said last mentioned output voltage varies within a range in which the constant current means is actuated normally; and

(d) a setting circuit for determining whether or not the constant current means is in condition to excite said electromagnet so that the shutter or diaphragm may be controlled.

4,104,667

MOUNTING MEANS FOR BLADES OF PHOTOGRAPHIC SHUTTERS

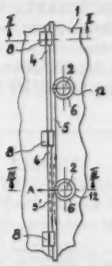
Erwin Scholz, and Albert Ehlers, both of Brunswick, Fed. Rep. of Germany, assignors to Rollei-Werke Franke & Heidecke, Brunswick, Fed. Rep. of Germany

Filed Mar. 7, 1977, Ser. No. 774,685

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1976, 2610350

Int. Cl.[2] G03B 9/10

U.S. Cl. 354—250 9 Claims



1. Mounting means for mounting photographic shutter blades swingably on a mounting member, said mounting means comprising means forming a plurality of bearing holes in said member, a trunnion secured to a shutter blade and rotatably received in each of said holes, each of said trunnions having a circumferential groove intermediate its length, a wire retaining groove in said mounting member, said wire retaining groove extending approximately tangentially with respect to all of said holes, and a single retaining wire extending along said wire retaining groove and engaged in the respective circumferential grooves of all of said trunnions to retain said trunnions against withdrawal from their respective holes.

4,104,668

CONTINUOUS PROCESSOR FOR PHOTOGRAPHIC FILMS OR THE LIKE

Erwin Laar, Taufkirchen, Fed. Rep. of Germany, assignor to AGFA-Gevaert, AG, Leverkusen, Fed. Rep. of Germany

Filed Apr. 1, 1977, Ser. No. 783,800

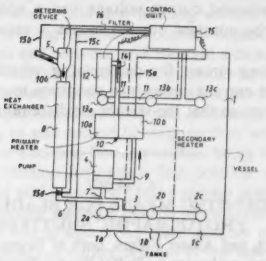
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 2616869

Int. Cl.[2] G03D 13/00

U.S. Cl. 354—299 10 Claims

1. In a developing machine for exposed photosensitive material, the combination of a vessel containing a supply of a first liquid and having at least one inlet and at least one outlet; first conduit means connecting said inlet with said outlet; pump means installed in said conduit means to circulate the first liquid through said conduit means from said outlet to said inlet; a heating device installed in said conduit means intermediate said pump means and said inlet, said device including a primary heater and an auxiliary heater; second conduit means communicating with said first conduit means upstream of said heating

device; means for admitting to said second conduit means a second liquid at certain intervals so that said second liquid is



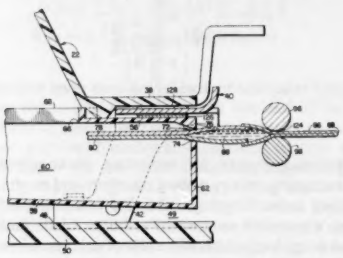
admixed to said first liquid; and control means including means for actuating said auxiliary heater during said intervals.

4,104,669

THERMALLY RESPONSIVE PHOTOGRAPHIC PROCESSING APPARATUS FOR USE WITH SELF-PROCESSABLE FILM UNITS

Harvey S. Friedman, Natick, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 15, 1977, Ser. No. 787,748
Int. Cl.[2] G03D *9/02*
U.S. Cl. 354—304 **12 Claims**



1. Photographic processing apparatus for use with a self-processable film unit of the type including a pair of sheet elements and a rupturable container of processing fluid positioned adjacent a leading edge of the film unit, the processing fluid having a viscosity which varies with temperature, said apparatus comprising:

means for spreading the processing fluid in a thin layer between the sheet elements, said fluid spreading means including a pair of elongated juxtaposed pressure applying members which define an elongated gap through which the film unit is advanced with the sheet elements in superposed relationship to apply a first pressure to the film unit to first rupture the container to release the processing fluid and then to cause the released mass of processing fluid to flow between the sheet elements opposite to the direction of advancement of the film unit through said gap such that the processing fluid is progressively deposited between the sheet elements as a thin layer extending over a preselected area of the sheet elements;

means for advancing the film unit through said gap; and

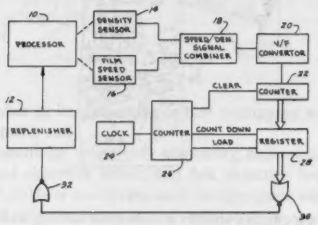
means for applying a second pressure to the film unit to oppose the flow of the processing fluid relative to the sheet elements as the film unit is advanced through said gap, said means for applying a second pressure being responsive to ambient temperature to adjust the magnitude of the flow opposition pressure applied so that the thickness of the processing fluid layer is maintained substantially constant over a predetermined temperature operating range of said apparatus.

4,104,670

AUTOMATIC REPLENISHER CONTROL

Ralph L. Charnley, Minneapolis, and Clyde A. Kumpula, Little Canada, both of, assignors to Pako Corporation, Minneapolis, Minn.

Filed Apr. 8, 1977, Ser. No. 785,840
Int. Cl.[2] G03D *13/00*
U.S. Cl. 354—324 **16 Claims**



1. A control system for controlling replenisher means to provide replenisher fluid to a processor of photosensitive material, the control system comprising:

variable frequency signal providing means for providing a variable frequency signal having a frequency indicative of a measured parameter associated with operation of the processor;

counter means for counting in response to the variable frequency signal;

interrogate means for interrogating the counter means at predetermined intervals; and

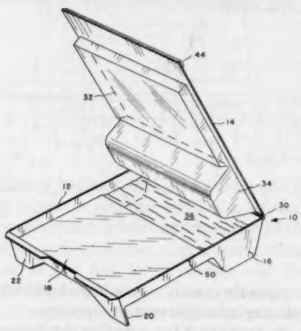
energizing signal providing means for providing an energizing signal to the replenisher means, the energizing signal having a time duration determined by the count in the counter when the counter means is interrogated.

4,104,671

PHOTOGRAPHIC PRINTING AND DEVELOPING TRAY

Roy M. Harrigan, Bromley Mountain Rd., Manchester, Vt. 05254

Filed Jan. 15, 1976, Ser. No. 649,454
Int. Cl.[2] G03D *13/02*; G03B *27/32*
U.S. Cl. 354—337 **5 Claims**



1. A tray for photographic printing and developing which comprises:

a lower member having a generally planar horizontal first surface and a reservoir section disposed with the bottom

thereof at a lower elevation than said planar horizontal first surface; and

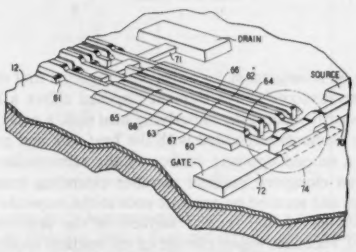
a cover cooperating with said lower member and having a transparent generally planar second surface disposed in generally parallel, spaced, overlapping relationship to said first generally planar surface when said cover is positioned on said lower member, said cover further including a depending displacement member extending into said reservoir section when said cover is positioned on said lower section to displace liquid located therein to a position intermediate said first and second generally planar surfaces, said displacement member being withdrawn from said reservoir section when said cover is moved away from said lower member to allow liquid intermediate said first and second surfaces to flow into said reservoir section.

4,104,672

HIGH POWER GALLIUM ARSENIDE SCHOTTKY BARRIER FIELD EFFECT TRANSISTOR

James Vincent DiLorenzo, Piscataway; Gerard Edward Mahoney, Branchburg, and Joseph Michael Moran, Berkeley Heights, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 29, 1976, Ser. No. 736,731
Int. Cl.[2] H01L *29/80, 29/48, 29/56*
U.S. Cl. 357—22 **4 Claims**



1. In combination in a high-power microminiature gallium arsenide field-effect-transistor device,

a gallium arsenide substrate having an epitaxial mesa formed thereon,

multiple interleaved source, gate and drain electrodes formed on said mesa, each of said electrodes including a portion that extends beyond one edge or the opposite edge of the mesa and onto said substrate,

a drain bus bar on said substrate adjacent said one edge of said mesa connecting together said drain electrodes,

a gate bus bar, including cross-under fingers, on said substrate adjacent the opposite edge of said mesa connecting together said gate electrodes,

insulating portions disposed on selected regions of said cross-under fingers,

and a source bus bar on said substrate adjacent said opposite edge of said mesa extending over the insulating portions on said cross-under fingers to connect together said source electrodes,

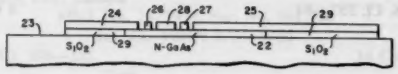
wherein said cross-under fingers are respectively deposited in convex-bottom channels formed in said substrate, each of said fingers comprising, in order of deposition, layers of germanium/gold, silver, gold and tungsten.

4,104,673

FIELD EFFECT PENTODE TRANSISTOR

Lawrence E. Dickens, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 7, 1977, Ser. No. 766,401
Int. Cl.[2] H01L *29/80*
U.S. Cl. 357—22 **7 Claims**



1. A field effect pentode transistor, comprising a first supporting layer of semi-conductive material, a second active semi-conductor layer formed on one face of the first layer,

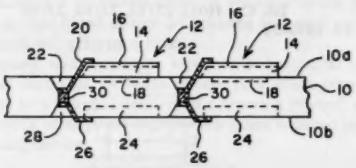
a source electrode and a drain electrode spaced from each other one portion of each said electrode being formed on the first layer and a second portion of each said electrode overlying and being in ohmic contact with the second layer, a screen electrodes spaced from and positioned between the source and drain electrodes, overlying and in ohmic contact with said second layer, a first control gate electrode formed on the second layer spaced from and positioned between the source and screen electrodes, and a second control gate formed on the second layer spaced from and positioned between the drain and screen electrodes.

4,104,674

DOUBLE SIDED HYBRID MOSAIC FOCAL PLANE

Robert V. Lorenze, Jr., Westford, and William Joseph White, Chelmsford, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 7, 1977, Ser. No. 766,327
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—30 **1 Claim**



1. An infrared detector system comprising:

a silicon semiconductor substrate having first and second surfaces;

a plurality of epitaxial (Hg,Cd)Te detectors on the first surface, each detector having p-type and n-type regions, the p-type regions being in an electrically conductive relationship with conductive areas on said substrate;

solid state signal processing circuitry formed in said semiconductor substrate proximate the second surface;

a plurality of first valleys in the first surface, a first valley being associated with each said detector;

a plurality of second valleys in the second surface positioned so that individual second valleys are opposite individual first valleys to form pairs of first and second valleys;

regions of ion implantation in said substrate respectively connecting the first and second valleys in each pair of valleys so as to provide high conductivity between the pairs of valleys in the first and second surfaces;

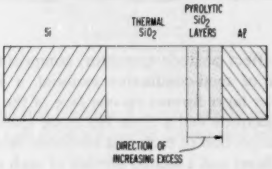
first electrode means individually connecting said detectors to said first valleys; and

second electrode means individually connecting said second valleys to said solid-state signal processing circuitry.

4,104,675
MODERATE FIELD HOLE AND ELECTRON INJECTION FROM ONE INTERFACE OF MIM OR MIS STRUCTURES

Donelli J. DiMaria, Mt. Kisco, and Donald R. Young, Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 21, 1977, Ser. No. 808,501
Int. Cl.[2] H01L 29/34
U.S. Cl. 357—54 8 Claims

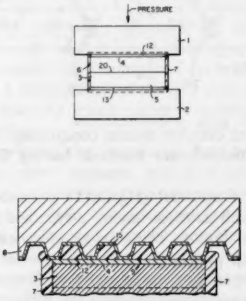


1. A metal-insulator-metal or metal-insulator-semiconductor structure wherein the band gap of the insulator layer near one interface only is reduced to provide an injection region where holes or electrons, depending on voltage bias, can be injected into the insulator under moderate electric field conditions from the contact at this interface while, simultaneously, electron or hole injection from the opposite interface is blocked due to the large insulator band gap near this interface.

4,104,676
SEMICONDUCTOR DEVICE WITH PRESSURE ELECTRICAL CONTACTS HAVING IRREGULAR SURFACES

Klaus Bednorz; Jon W. Johansen, and Fritz Scheidel, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 13, 1976, Ser. No. 750,074
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1975, 2556469
Int. Cl.[2] H01L 23/42, 23/44, 23/46
U.S. Cl. 357—79 7 Claims

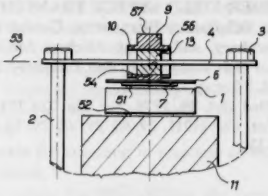


1. A semiconductor device comprising, a body of semiconductor material, said body having opposed, flat, substantially parallel main faces and an edge portion extending between said main faces, said body containing at least one pn junction, said pn junction being exposed at said edge portion of said body, a metal electrode affixed to and in electrical contact with a least a portion of each of said main faces, at least one lead electrode having at least a portion of a surface in physical and electrical contact with at least a portion of at least one of said metal electrodes, at least a portion of said surface of said lead electrode being held in said physical and electrical contact with said metal electrode by a compressive force, said surface of said lead electrode being comprised of lands and grooves with said lands being the portion of the surface of said lead electrode in physical and electrical contact with said metal electrode, a layer of a protective coating disposed on said edge portion of said body of semiconductor material and on at least a portion of said main faces, said layer of protective coating extending over at least a portion of said metal electrode and into the grooves in the surface of said lead electrode, the grooves in the surface of said lead electrode having a depth greater than the thickness of the protective layer and at least the land portions of the surface of the lead electrode having a Brinell hardness greater than the hardness of the protective layer.

4,104,677
ARRANGEMENT FOR ADJUSTABLY URGING A SEMI-CONDUCTIVE ELEMENT AGAINST A HEAT SINK

Jiří Kovář; Pavel Kafuněk; Pavel Reichel; Oldřich Pokorný; Michal Pellant; Jindřich Kratina, and Jaroslav Zâna, all of Prague, Czechoslovakia, assignors to CKD Praha, oborovy podnik, Prague, Czechoslovakia

Filed Nov. 26, 1976, Ser. No. 745,201
Claims priority, application Czechoslovakia, Nov. 28, 1975, 8082-75
Int. Cl.[2] H01L 23/02, 23/48, 29/44
U.S. Cl. 357—81 7 Claims



1. In an arrangement for adjustably urging a first surface of a planar semiconductive element disposed above a heat sink downwardly against the underlying heat sink, a pair of spaced anchor elements associated with the heat sink and projecting above a second opposite surface of the semiconductive element, an elongated resilient member extending transversely between and secured on opposite ends to the respective anchor elements above the second surface of the semiconductive element, eccentric means carried on the resilient member intermediate its ends above the second surface of the semiconductive element for rotation in a vertical plane against the biasing force of the resilient member, and means associated with the eccentric means for contacting the underlying second surface of the semiconductive element with a variable downward pressure corresponding to the rotation of the eccentric to correspondingly urge the first surface of the semiconductive element against the heat sink.

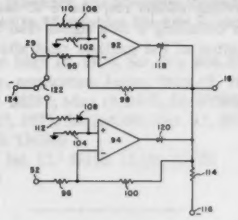
4,104,678
VIDEO SWITCHING CIRCUIT

Frederik Johannes Van Roessel, Upper Saddle River, N.J., assignor to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 624,727, Oct. 22, 1975, abandoned.
This application May 19, 1977, Ser. No. 798,320
Int. Cl.[2] H04N 9/52
U.S. Cl. 358—30 7 Claims

1. A circuit comprising two differential amplifiers, each of said amplifiers having inverting input means for receiving respective input signals, a common emitter lead pair, and a common low impedance output, each pair of said emitter leads including a diode, each amplifier further comprising a feedback network coupled to said common output and to said

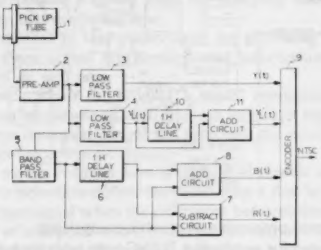
respective input means, and means coupled to said amplifiers for selecting which of said input signals is amplified and applied to said common output including switchable means for biasing one of said diodes on and the other diode off.



4,104,679
COLOR ERROR SUPPRESSION APPARATUS AND METHOD

Yoshinori Kitamura, Katano, and Ryuhei Nakabe, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 599,651, Mar. 18, 1975, abandoned. This application Oct. 1, 1976, Ser. No. 728,884
Claims priority, application, Japan, Mar. 18, 1974, 49-31204; Mar. 19, 1974, 49-32121; Mar. 19, 1974, 49-32122; Sep. 26, 1974, 49-11036
Int. Cl.[2] H04N *9/07*
U.S. Cl. 358—44 **23 Claims**



1. A color error suppression apparatus for a color television camera in which at least a first and second color are spatially modulated in a pick-up tube by color filter means, so that at least one of the modulated signals representing the first and second colors has a phase which is different from the phase of the same color in adjacent scan lines and color signals are produced by utilizing the difference in phases in successive scan lins, said apparatus comprising:

color correction signal generating means including a filter circuit means responsive to an output from said pickup tube for generating a luminance signal representing the luminance of the color signal, a delay circuit means coupled to said filter circuit means for delaying said luminance signal and a correction circuit means coupled to said filter circuit means and said delay circuit means for operatively combining said luminance signal and the output of said delay circuit means for generating a color correction signal;

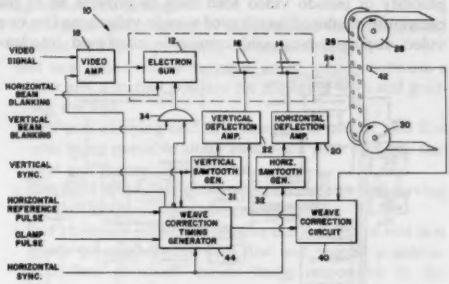
color component recovery circuit means responsive to the modulated component of the output from said pick-up tube for operating upon such component to recover color component signals which represent at least the first and second colors of the color image and include color error components generated in this circuit means; and

signal combining circuit means coupled to said color correction signal generating means, and said color component recovering circuit means and responsive at least to said color correction signal and color component signals for combining said signals to generate color signals representing colors of the color image, such that the color error components included in the color signals are suppressed.

4,104,680
METHOD AND APPARATUS FOR FILM WEAVE CORRECTION

David E. Holland, Sepulveda, Calif., assignor to Ellanin Investments, Ltd., Canada

Filed Jan. 24, 1977, Ser. No. 761,710
Int. Cl.[2] H04N *3/36, 5/86*
U.S. Cl. 358—132 **14 Claims**



1. The method of correcting film weave in a motion picture film recording or reproducing apparatus using a scanning device which employs a continuous motion film drive during scanning of the film over a plurality of frames of data comprising the steps of:

(a) causing the scanning beam to horizontally cross the edge of a sprocket hole on said film;

(b) detecting said beam as it crosses said sprocket hole edge and generating an edge crossing occurrence signal representative thereof;

(c) comparing this edge crossing occurrence signal with a reference time;

(d) generating a correction signal in response to the difference in time found in step (*c*) between said edge crossing time and said reference time;

(e) coupling said correction signal to a horizontal sweep circuit such that all beam sweeps in a given frame are shifted in horizontal position as a function thereof; and

(f) repeating of steps (*a*)–(*e*) for each frame scanned by said scanning device.

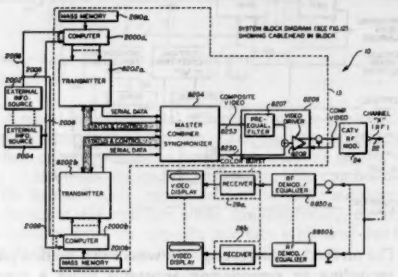
4,104,681
INTERLEAVED PROCESSOR AND CABLE HEAD

Richard Saylor, Monsey; Alfred A. Dalimonte, Westbury, and Robert H. Nagel, New York, all of N.Y., assignors to IDR, Inc., Farmingdale, N.Y.

Filed Oct. 27, 1976, Ser. No. 736,217
Int. Cl.[2] H04N *1/02*
U.S. Cl. 358—141 **28 Claims**

1. A real time frame grabbing system for substantially instantaneously providing a continuous video display of a selectable predetermined video frame of information on a video display means from continuously transmittable video information comprising first means for transmitting said video information as a first plurality of pseudo video scan lines, second means for transmitting said video information as a second plurality of pseudo video scan lines, each of said pseudo video scan lines from said first and second transmitting means having a television video scan line format and capable of comprising a complete self-contained packet of digital information sufficient to provide an entire displayable row of video data characters, said displayable row comprising a plurality of television video scan lines, said pseudo video scan line having an associated transmission time equivalent to said television video scan line, said

packet of digital information comprising at least address information for said displayable row and data information for said displayable characters in said displayable row, said first transmitting means transmitting said first plurality of pseudo video scan lines out of phase in time in a predetermined phase relationship with the transmission of said second plurality of pseudo video scan lines by said second transmitting means with said digital information content of said first and second plurality of pseudo video scan lines being substantially identical, and means for selectively combining and interleaving corresponding identical out of phase digital information content containing pseudo video scan line portions of said first and second plurality of pseudo video scan lines to provide an in phase composite combined interleaved pseudo video scan line to said video display means, said composite combined interleaved



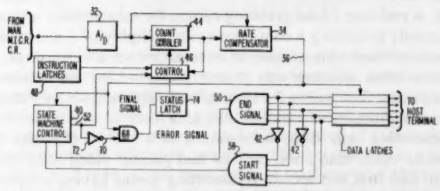
pseudo video scan line having said television video scan line format and capable of comprising a complete self-contained composite packet of digital information equivalent in content to said content of either of said interleaved pseudo video scan lines and sufficient to provide said entire displayable row of video data characters to said video display means, said combined interleaved composite pseudo video scan line having said associated transmission time, the interleaved information containing portions of said corresponding pseudo video scan line of said first plurality of pseudo video scan lines comprising different television video scan lines of said plurality of television video scan lines which comprise said composite pseudo video scan line displayable row than the interleaved portions of said corresponding pseudo video scan line of said second plurality of pseudo video scan lines.

4,104,682

APPARATUS FOR REDUCING THE NUMBER OF UNDETECTED ERRORS READ ALONG THE LENGTH OF A BINARY INFORMATION BEARING MEDIUM

Gerald J. Lehner, and Eugene F. Banka, both of Livonia, Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Mar. 7, 1977, Ser. No. 774,740
Int. Cl.[2] G06K *7/08, 7/10;* **G11B** *25/04*
U.S. Cl. 360—2 **11 Claims**



1. An apparatus for reducing the number of undetected errors serially read along the length of a binary information bearing medium, the read information comprising a serial self-clocking data stream having clock and data signals including a start signal, an end signal, and a summation signal following the end signal to indicate the number of data signals in the data stream, said apparatus comprising:

first detecting means for detecting the end signal; and

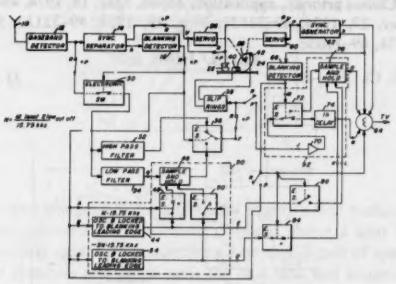
second detecting means responsive to said first detecting means for detecting a data signal read from a predetermined portion of the medium read after the summation signal.

4,104,683

VIDEO RECORDING APPARATUS

Edward Maurice Granger, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 24, 1976, Ser. No. 669,925
Int. Cl.[2] H04N *5/79, 5/795*
U.S. Cl. 360—9 **3 Claims**



1. Signal processing apparatus comprising:

a. means for producing NTSC-type television signals;

b. means for stripping sync and blanking information from said NTSC-type television signals, thereby to produce a series of video signals separated in time from each other;

c. means for splitting the video signals into respective high and low frequency component bands;

d. means for time compressing the signals which comprise the low frequency component band of the video signals so that such signals respectively occur during periods corresponding to the duration of sync and blanking;

e. means for delaying the signals which comprise the time compressed low frequency band to occur respectively during the time separation between successive video signals; and

f. means for combining the signals which comprise the delayed time compressed low frequency band with the signals which comprise the high frequency band, thereby to produce a train of signals having high frequency components periodically interspersed with low frequency components, and

a. said means for time compressing the signals which comprise the low frequency component band being adapted to time compress such signals to occur during a period less than the duration of sync and blanking; and

b. wherein said apparatus includes means for adding reference signal information to occur during that part of the time separation between successive video signals which is unoccupied by time compressed signals.

4,104,684

ROTARY HEAD TYPE MAGNETIC VIDEO RECORDING AND REPRODUCING SYSTEM

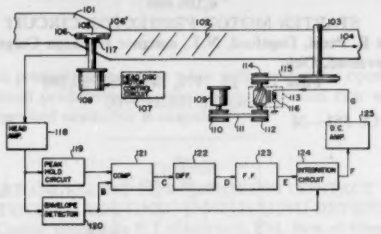
Noboru Wakami, Hirakata, and Masshiro Deguchi, Yao, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 14, 1976, Ser. No. 686,396

Claims priority, application Japan, May 19, 1975, 50/60386; May 19, 1975, 50/60387; May 19, 1975, 50/60388; Jul. 14, 1975, 50/86505; Aug. 27, 1975, 50/104380; Nov. 12, 1975, 50/136502; Nov. 12, 1975, 50/136503

Int. Cl.[2] G11B *15/46, 15/26*

U.S. Cl. 360—70 17 Claims



1. A rotary head type magnetic recording and reproducing system comprising:

means for transporting a magnetic tape having an information signal thereon in record tracks which are oblique to the longitudinal length of the tape,

means for rotating a rotary head for scanning said record tracks on said magnetic tape,

means connected to said rotary head for providing a read-out envelope signal representing said information signal recorded on said tape,

a peak hold circuit for holding a signal representing the maximum amplitude of said read-out envelope signal,

an envelope detection circuit for detecting the envelope of said read-out envelope signal,

detection means coupled to said peak hold circuit and said envelope detection circuit for producing a first level output voltage signal when the difference between the output voltage of said peak hold circuit and the output voltage of said envelope detection circuit is less than a predermined threshold and producing a second level output voltage signal when the difference between the output voltage of said peak hold circuit and the output voltage of said envelope detection circuit is greater than or equal to said threshold voltage,

control signal producing means responsive to the output of said detection means for producing a first control signal, and

control means responsive to said first control signal for controlling the movement of either said tape transport means or said rotary head rotating means to control the relative positional relationship between a trace of rotation of said rotary head and said record tracks on said magnetic tape.

4,104,685

VIDEO RECORDER/REPRODUCER TRANSPORT HAVING TWO MOVABLE TENSION GUIDES FOR CONTROLLING TAPE TENSION

David T. L. Chang, Palo Alto, Calif., assignor to Recortec, Inc., Sunnyvale, Calif.

Filed Jan. 13, 1977, Ser. No. 759,238

Int. Cl.[2] G11B *15/43;* G03B *1/04;* B65H *59/38, 63/02*

U.S. Cl. 360—84 5 Claims

1. In an improved video magnetic tape recording/playback transport apparatus including a supply of magnetic recording tape having a first end portion wound around a tape supply means and having a second end portion wound around a tape take-up means, a tape driving capstan intermediate to the tape supply means and the tape take-up means and engaging the tape, a helical head scanner assembly positioned intermediate the capstan and one of the tape means having a midlength portion of the tape helically wrapped thereabout, tape tension sensing means for producing a first and a second signal, servo control means responsive to the first and to the second signal and operative to generate a first and a second servo control signal, first motor means responsive to said first servo signal and operative to drive said tape supply means and second motor means responsive to said second servo signal and operative to drive said tape take-up means, an improved tension sensing means comprising:

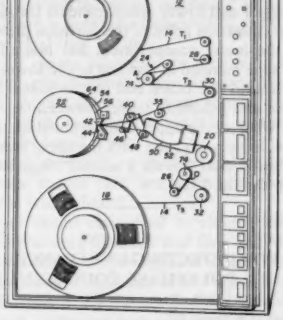
a first tension guide assembly intermediate the helical head scanner and the tape supply means including

first tape guide means movable under tension between a first and a second position for engaging with and guiding the tape,

a first arm carrying said first tape guide means, said first arm being movable along an arcuate path between said first and said second position,

a first light source mounted on said first arm and serving to emit an illuminating beam of light,

a first photocell means for sensing the location of said first guide means between said first and second positions, said first photocell means being responsive to the



amount of light illuminating it and operative to produce a first signal, said first photocell means being mounted on said first tape guide means,

a first fixed plate disposed between said first light source and said first photocell means, said first plate including an arcuately-shaped aperture that may serve to partially block the light emitted by said first light source so that an amount of light corresponding to the location of said first tape guide means illuminates said first photocell means;

a second tension guide assembly intermediate the helical head scanner and the tape take-up means including

second tape guide means movable under tension between a third and fourth position for engaging with and guiding the tape,

a second arm carrying said second tape guide means, said second arm being movable along an arcuate path between said third and fourth positions,

a second light source mounted on said second arm and serving to emit an illuminating beam of light,

a second photocell means for sensing the location of said second guide means between said third and fourth positions, said second photocell means being responsive to the amount of light illuminating it and operative to

produce a second signal, said photocell means being mounted on said second tape guide means;

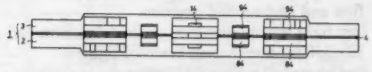
a second fixed plate disposed between said second light source and said second photocell means, said second plate including an arcuately-shaped aperture that may serve to partially block the light emitted by said second light source so that an amount of light corresponding to the location of said second tape guide means illuminates said second photocell means.

4,104,686

TAPE CASSETTE WITH REEL TO REEL AND ENDLESS TAPES

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Nov. 21, 1977, Ser. No. 853,512
Claims priority, application Japan, Nov. 22, 1976, 51-140561
Int. Cl.[2] B65H *17/48;* G11B *23/04;* H04M *1/64*
U.S. Cl. 360—132 **1 Claim**



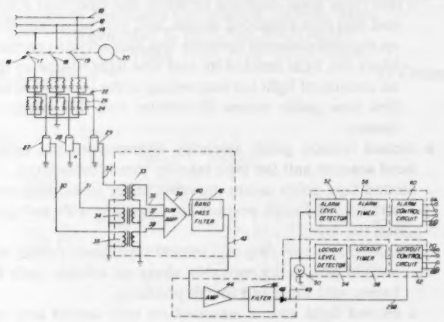
1. A tape cassette comprising a cassette composed of an upper and a lower cassette half, and a partition plate disposed in the cassette to extend therein in a transverse direction to define an upper and a lower compartment, wherein the partition plate has first and second reel insertion holes, wherein the cassette has disposed therein first and second reels extending into the upper and lower compartments through the first and second reel insertion holes of the partition plates, respectively, wherein the lower compartment has housed therein a first magnetic tape retained at one end to the lower half part of the first reel and at the other end to the lower half part of the second reel and guided to travel between the first and second reels, and wherein the upper compartment has disposed therein a third reel loosely engaged with the upper half part of the first reel and has housed therein a second magnetic tape endlessly wound on the third reel.

4,104,687

DEVICE FOR DETECTING UNBALANCED CONDITIONS IN A POLYPHASE EQUIPMENT BANK

John A. Zulaski, Mt. Prospect, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Nov. 24, 1976, Ser. No. 744,868
Int. Cl.[2] H02H *7/16*
U.S. Cl. 361—17 **25 Claims**



25. A device for detecting voltage unbalances in a grounded polyphase equipment bank, each phase leg of the bank being energized by a respective line of an electrical power system, the unbalances resulting from failure or inadvertent change of one or more components of the polyphase equipment bank comprising:

voltage sensing means for providing a voltage signal between an electrically similar point within each phase leg of the equipment bank and ground, the voltage at each such similar point being less than line voltage;

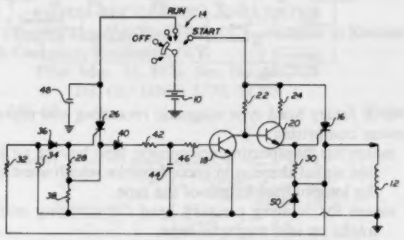
means for summing the voltage signals from each phase leg and creating an artificial neutral voltage as long as there is no failure or change of the components but providing an AC signal when the components fail or change representative of the voltage unbalance caused by the failure or change of components.

4,104,688

STARTER MOTOR PROTECTOR CIRCUIT

Louis E. Pecsi, Deptford, N.J., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 13, 1976, Ser. No. 750,298
Int. Cl.[2] H02H *7/00*
U.S. Cl. 361—28 **6 Claims**



4. A circuit for preventing energization of a starter motor for an internal combustion engine when the internal combustion engine is running comprising:

a power supply;

a starter relay for energizing the starter motor;

control means for establishing an engine start signal and an engine run signal, said control means being capable to simultaneously establish said start and run signals and to establish said run signal without the establishment of said start signal;

first switching means actuated by a control signal applied thereto in response to said start signal, said first switching means, when actuated, connecting said power supply to said starter relay to energize said starter relay;

second switching means actuated by a control signal applied thereto in response to said run signal and energization of said starter relay, said second switching means, when actuated, prohibiting said first switching means from being responsive to said start signal as long as said run signal is applied to said second switching means, and circuitry for providing a first time delay preventing the actuation of said second switching means in response to said run signal and energization of said starter relay until said first time delay has expired.

4,104,689

VACUUM CONTACTOR PROTECTOR

Thomas G. Rohner, Minneapolis, Minn., assignor to Electric Machinery Manufacturing Company, Minneapolis, Minn.

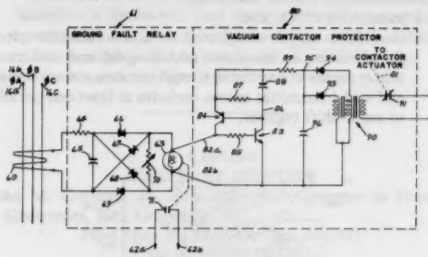
Filed Sep. 29, 1976, Ser. No. 727,663
Int. Cl.[2] H02H *7/22, 3/28*
U.S. Cl. 361—44 **9 Claims**

5. Protection apparatus for a power system having a vacuum contactor including actuating means therefor, comprising:

means for sensing current imbalance in said power system; and

means connected to said sensing means and operatively

associated with said vacuum contactor for providing an output signal indicating when said imbalance reaches a



first predetermined value when said contactor is open or a second predetermined value larger than said first value, when said contactor is closed.

4,104,690

ARRANGEMENT FOR RECEIVING CONTACT POTENTIAL RESPONSIVE SWITCHING DEVICES

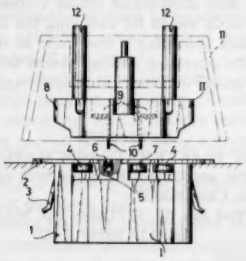
Endre Csutor, Hochstein 5, Ludenscheid, Fed. Rep. of Germany (588); Leo Mittler, Beethovenstr. 9, Meinerzhagen, Fed. Rep. of Germany (5892), and Rudolf Wörtche, Parkstr. 155c, Ludenscheid, Fed. Rep. of Germany (588)

Filed Oct. 12, 1976, Ser. No. 732,401

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1975, 2546868

Int. Cl.[2] H02B *3/28*

U.S. Cl. 361—45 **5 Claims**



1. An arrangement of a contact potential responsive switching device including

(a) a switching device socket supporting the constituent parts of a contact potential responsive switching device which are a plurality of relatively movable contacts, a latch mechanism for maintaining said contacts in the closed position thereof, a first operating member for manually operating said latch mechanism, a tripping coil responsive to the contact potential prevailing between ground and a load for automatically tripping said latch mechanism, a change-over switch for selectively connecting a phase-conductor over said tripping coil to ground, a first pair of terminals for connecting a power supply to some of said contacts, a second pair of terminals for connecting others of said contacts to said load;

(b) said second pair of terminals being conductively connected to a first pair of female contacts;

(c) a receptacle body arranged in front of said socket and affixed to said socket, said receptacle body having a second pair of female contacts each conductively connected to a stab contact projecting beyond said receptacle body and cooperating with said first pair of female contacts, and said receptacle body further defining a pair of passageways of which one receives manual operating means for said latch mechanism and the other receives operating means for said change-over switch.

4,104,691

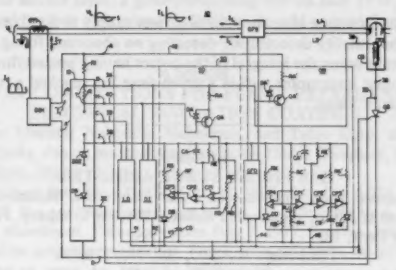
CIRCUIT BREAKER APPARATUS INCLUDING ASYMMETRICAL FAULT DETECTOR

Alan B. Shimp, Monroeville; Thomas N. Meyer, Murrysville, and Robert T. Elms, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 30, 1976, Ser. No. 728,088

Int. Cl.[2] H02H *3/08*

U.S. Cl. 361—96 **12 Claims**



1. Circuit breaker apparatus, comprising:

a. monitoring means interconnected with an electrical conductor in which a decaying asymmetrical fault current is present, said monitoring means providing an ouput voltage signal which is generally proportional to the value of said asymmetrical fault current;

b. peak detector means connected to receive said proportional output voltage signal from said monitoring means and provide a peak detector output voltage at the time said voltage signal from said monitoring means first exceeds a predetermined level;

c. storing means connected to receive said peak detector output voltage at said time and store said voltage as a discrete value within limits;

d. timed output means connected to receive said stored voltage of said storing means at said time and to produce a timed output means output signal at a time thereafter if all successive monitoring means output signal signal peaks do not occur below said predetermined level within a predetermined number of fault current cycles, said timed output means output signal not being produced if any successive signal peak from said monitoring means occurs below said predetermined level before said predetermined number of fault current cycles have expired; and

e. circuit interrupting means having the separable main contacts thereof connected in circuit relationship with said conductor, said circuit interrupting means being interconnected with said timed output means to receive said timed output means output signal, said separable main contacts opening to interrupt said fault current when said output signal is produced.

4,104,692

DEVICE FOR DETECTING ABNORMAL TEMPERATURE IN FIXER

Katsumi Sudo, and Yukio Kanazawa, both of Ebina, Japan, assignors to Rank Xerox, Ltd., London, England

Filed Jan. 3, 1977, Ser. No. 756,522

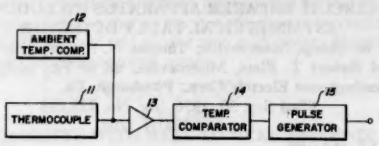
Claims priority, application Japan, Jan. 19, 1976, 51-004717

Int. Cl.[2] H02H *5/04*

U.S. Cl. 361—106 **2 Claims**

1. A device for detecting an abnormal temperature in a fixer, including a pulse generation controller capable of detecting the temperature in the fixer, comparing it with a predetermined reference temperature, and generating pulses continuously

during the time period that the fixer temperature is lower than the reference temperature; a pulse interrupter for interrupting the pulse output from the pulse generation controller until the temperature in the fixer reaches a desired fixing temperature



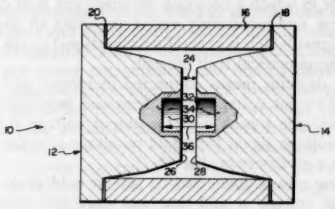
for the first time after the start of power supply to the fixer, and an abnormality detector for detecting an abnormal fixing temperature when the integral of the pulses having passed through the pulse interrupter within a given time has reached a predetermined value.

4,104,693

GAS FILLED SURGE ARRESTER

Toshiharu Toda, Mitaka, and Daizo Shigemori, Sagami-Hara, both of Japan, assignors to Reliable Electric Company, Franklin Park, Ill.

Filed Mar. 18, 1977, Ser. No. 778,992
Claims priority, application Japan, Mar. 23, 1976, 51-034113
Int. Cl.[2] H02H 9/06
U.S. Cl. 361—120 **7 Claims**



1. A gas-filled surge arrester comprising a generally cylindrical tubular insulator member, a pair of electrodes of substantially uniform composition having opposed generally planar end faces, said electrodes being hermetically sealed to opposite ends of said insulator member, said insulator member, serving to isolate electrically said electrodes and to space apart said opposed end faces to define a discharge gap therebetween, said electrodes including at least one pair of opposed cavities formed as recesses in the end faces, the cavity in each face being of a size as to occupy less than the full end face area and the cavities having respective end walls which are spaced apart a distance greater than the width of said gap, said cavities being lined with a substance of high electron emission ability relative to that of the adjacent electrode material at said gap, said substance in each cavity forming a ring substantially coplanar with the associated end face and the depth and width of the cavities being such that the discharge tends to take place between said lined cavities to discourage dispersion of particles from the electrodes during discharge onto the insulator member.

4,104,694

ASYNCHRONOUS DIGITAL LOCKING SYSTEM

Daniel J. Hargrove, 4306 NE. 6th Ave., Ft. Lauderdale, Fla. 33308

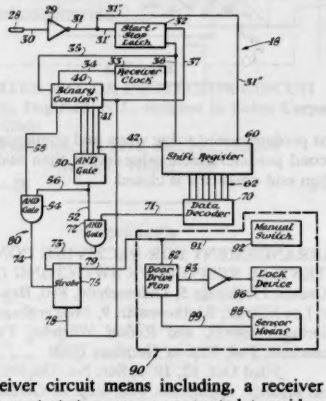
Continuation-in-part of Ser. No. 520,460, Nov. 4, 1974, abandoned. This application Oct. 28, 1976, Ser. No. 736,715
Int. Cl.[2] H04Q 9/00
U.S. Cl. 361—172 **12 Claims**

1. An electronic combination locking system including a binary electrical transmitter circuit and a binary electrical receiver circuit means in which the transmitter circuit signal to the receiver circuit enables the receiver clock comprising:

said transmitter circuit including,

a transmitter clock, and

a transmitter means connected to said transmitter clock for providing an timed and coded signal, and said transmitter means connectable to said receiver circuit means, and said transmitter means includes at least one parallel to serial shift register,



said receiver circuit means including, a receiver clock means, a start-stop means connected to said receiver clock means, said start-stop means connectable to said transmitter means for enabling said receiver clock means by receipt of said timed and coded signal, and

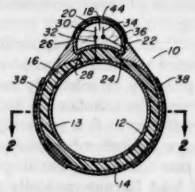
data and time comparator means connected to said receiver clock means for decoding the timed and coded signal and providing a true code at true time output signal for operating locking means when the receiver circuit means is connected to said transmitter means.

4,104,695

STATIC ELECTRICITY DISCHARGE RING

Wanda L. Hollis, and Darrell E. Hollis, both of 637 High Point Dr., Ventura, Calif. 93003

Filed Jan. 27, 1977, Ser. No. 763,034
Int. Cl.[2] H05F 3/00
U.S. Cl. 361—220 **23 Claims**



1. A static electricity discharge ring for discharging static electricity from a human body comprising:

a. a first substantially ring-shaped electrically conductive member having an inside surface adapted to abut the human body, said inside surface providing a reduction in the shock perceptible to a human body during discharge of static electricity accumulated in the human body by reducing the amount of static electricity discharging through a unit area of skin;

b. a second substantially ring-shaped electrically conductive member spaced from said first member; and

c. discharge indication means electrically interconnected

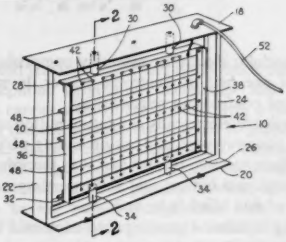
between said first member and said second member for providing an indication of the discharge of static electricity accumulated in the human body when said second member is grounded, said static electricity traversing a path from the human body through said first member, then through said discharge means, then through said second member to ground.

4,104,696

GRID WIRE SUPPORT

John M. Cochran, Jr., Greenville, S.C., assignor to Frontier Electronics, Inc., Greenville, S.C.

Filed May 27, 1977, Ser. No. 801,077
Int. Cl.[2] F24F *3/12*
U.S. Cl. 361—229 **4 Claims**



1. A grid for use in a duct for imparting ions in the air flowing through said duct responsive to a voltage being imparted to said grid from a voltage source, said grid comprising:

a housing corresponding in shape to the interior of said duct;

a horizontally extending upper support member carried adjacent the top of said housing:

a horizontally extending non-conductive lower support member carried adjacent the bottom of said housing;

a horizontally extending non-conductive intermediate support member carried in said housing between said upper and lower support members;

laterally spaced grid wires extending between said upper and lower support members; and

means for securing said grid wires to said horizontally extending non-conductive intermediate support member so as to minimize the length of free swinging wire in case a grid wire breaks;

whereby a substantially uniform discharge of ions is produced by said grid wires when a voltage is applied to said grid and grid wires.

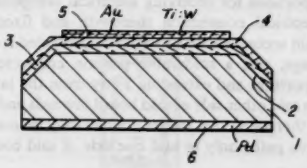
4,104,697

DISCRETE, FIXED-VALUE CAPACITOR

Don L. Kendall, La Paz, Mexico; Byron T. Ahlburn, Dallas, and Klaus C. Wiemer, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 582,951, Jun. 2, 1975, Pat. No. 4,015,175. This application Jan. 14, 1977, Ser. No. 759,518
The portion of the term of this patent subsequent to Mar. 29, 1994, has been disclaimed.
Int. Cl.[2] H01G *1/01*
U.S. Cl. 361—305 **5 Claims**

1. A capacitor device comprising a double-plug, coaxial-lead, glass-sealed package having a semiconductor capacitor chip sealed therein said chip comprising a monocrystalline silicon body doped to a concentration in excess of 10^{19} atoms per cm^3 and having first and second substantially parallel opposite faces, a first dielectric layer of thermally grown silicon oxide on said first face, a second dielectric layer on said oxide comprising silicon nitride, a first metal film comprising Ti:W



on said nitride layer, a gold-comprising film on said Ti:W, and a metal contact comprising palladium on said second face.

4,104,698

WAX COMPOSITIONS FOR FLAME RETARDANT ELECTRICAL INSULATION COATINGS

Takao Murata; Nobutaka Nakamura, and Tateo Goto, all of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Division of Ser. No. 621,458, Oct. 10, 1975, Pat. No. 4,032,490, which is a continuation-in-part of Ser. No. 524,304, Nov. 15, 1974, abandoned. This application Feb. 7, 1977, Ser. No. 766,413
Claims priority, application Japan, Nov. 15, 1973, 48-127721
Int. Cl.[2] H01G *4/12*
U.S. Cl. 361—321 **6 Claims**

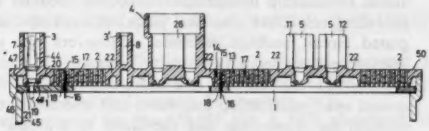
1. A ceramic capacitor containing as a coating an electrical insulating composition comprising a microcrystalline wax, a halogenated organic flame retardant, and a synthetic resin, the improvement wherein the insulating composition contains as a flame retardant tribromophenol alkyl ether which has a decomposition temperature above about 200° C and which has a melting point of about 70° C to about 150° C in a proportion of about 10 to about 200 percent by weight of the wax and as the synthetic resin a thermoplastic resin selected from the group consisting of phenolic resins, alkyl-phenolic resins, alkyl-benzene resins, terpene resins, cumarone resins, quanamine resins, and alicyclic saturated hydrocarbon resins, said thermoplastic resin having a melting point of about 70° C to about 150° C and is present in a proportion of about 10 to about 50 percent by weight of said wax.

4,104,699

ELECTRICAL CURRENT DISTRIBUTING ARRANGEMENT

Alfred Könnemann, Wuppertal, Fed. Rep. of Germany, assignor to Grote & Hartmann GmbH & Co KG, Wuppertal, Fed. Rep. of Germany

Filed Dec. 8, 1976, Ser. No. 748,543
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1975, 2555708
Int. Cl.[2] H05K *1/02*
U.S. Cl. 361—349 **23 Claims**



1. A current-distributing arrangement for electrical components, comprising an electrical circuit board having opposite sides, and conductive paths at one of said sides; an elongated mounting member mounted at the other of said sides, said mounting member having first wall portions which bound a plurality of first sockets, and second wall portions which bound a plurality of second sockets and which are raised relative to said first wall portions in direction away from said one

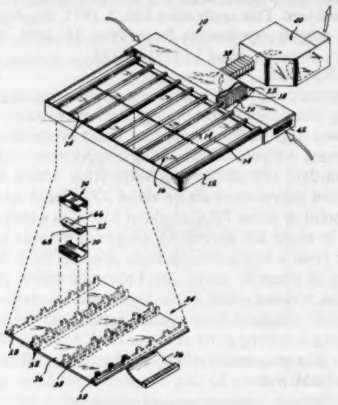
side of said board said sockets being spaced from one another in and transverse to the direction of elongation of said mounting member; and spring contact members each having resilient contact portions for receiving electrical components so as to make electrical connection therewith and fixedly mounted within said second sockets so as to be protected from mechanical damage, and a solderable portion connected with said contact portions and extending away from the latter in direction from said other side of said board towards and beyond said one side thereof so that solder contact may be made with said conductive paths only at said one side of said board.

4,104,700

HEAT PIPE COOLING FOR SEMICONDUCTOR DEVICE PACKAGING SYSTEM

Robert V. Hutchison, Oceanside; Peter P. Gregg, Vista, and James J. MacBride, Carlsbad, all of Calif., assignors to Burroughs Corporation, San Diego, Calif.

Filed Jan. 31, 1977, Ser. No. 764,064
Int. Cl.[2] H02B *1/00*
U.S. Cl. 361—384 **16 Claims**



1. In a system for packaging and cooling electronic equipment, a sub-island comprising,

a plurality of integrated circuit packages, each package having a plurality of electrical conductors and an integral heat sink member thereon,

connector means for mounting said packages,

an interconnection medium having a plurality of conductor leads,

each of said connector means having a plurality of electrical contacts and being operatively connected in a predetermined relationship to said interconnection medium and providing respective electrical paths between said integrated circuit package electrical conductors and said interconnection medium conductor leads,

interconnection medium heat sink means disposed in parallel spaced apart relationship transverse said interconnection medium for connecting said sub-island to a means for conducting heat from said integrated circuit package, and

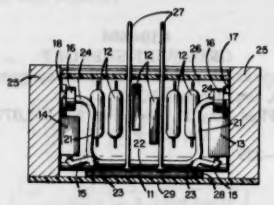
means for clamping said integrated circuit packages into said connector means and said package heat sink members into engagement with said interconnection medium heat sink means, so that heat generated by said packages is transferred to said interconnection medium heat sink means, said integrated circuit packages, interconnection medium, and clamping means thus forming an integral unit interconnected electrically and thermally.

4,104,701

MOUNTING ASSEMBLY FOR ELECTRONIC POWER DEVICES

Conrad J. Baranowski, Arlington Heights, Mass., assignor to Powercube Corporation, Waltham, Mass.

Filed Nov. 22, 1976, Ser. No. 744,137
Int. Cl.[2] H05K *7/20*
U.S. Cl. 361—386 **17 Claims**



1. A modular electronic assembly comprising:

at least one pair of electronic power devices arranged in spaced confronting relationship;

a deformable electrically insulating button mounted to each said power device, said button having a blind hole extending from one side thereof part way therethrough and a slot through said button, said slot extending radially from the axis of said blind hole; and

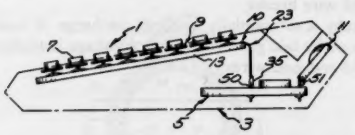
a spring member extending into each said blind hole, said spring member being arranged between and urging apart said power devices in each said pair of said power devices.

4,104,702

KEYBOARD APPARATUS INCLUDING ELONGATED BAR FOR ALIGNING LEVEL FROM CONNECTORS TO MOTHERBOARD

James J. Armstrong, Seekonk, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 6, 1976, Ser. No. 747,653
Int. Cl.[2] H05K *1/00*; H01H *9/00*
U.S. Cl. 361—421 **10 Claims**



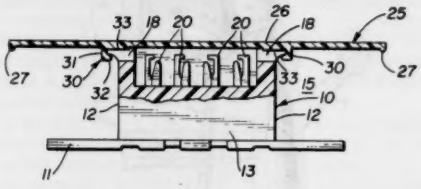
1. A switch assembly comprising a base member, switching stations disposed on the base member, a plurality of electrically conductive wires supported by the base member each having a free end extending beyond the base member in a direction parallel to a given axis, the wires providing means for electrically connecting the switches to a motherboard, a spacer bar having a stop surface extending along its length disposed intermediate the free ends of the wires and the base member, the wires attached to the bar a selected distance from the free ends of the wires so that the stop surface extends in a direction generally perpendicular to the given axis whereby bending of the wires prior to assembly of the switch assembly to the motherboard is minimized as well as providing a stop surface so that a given length of each wire is presented for connection to the motherboard.

4,104,703

TERMINAL BLOCK COVER FOR COVERING BLOCK AND SPACE BETWEEN ADJACENT BLOCKS

Kenneth W. Hotchkiss, Golden, Colo., assignor to Proto Production Plastics, Inc., Boulder, Colo.

Filed Aug. 30, 1976, Ser. No. 718,886
Int. Cl.[2] H02B *1/06*; H01B *17/00*
U.S. Cl. 361—426 5 Claims



2. An improved terminal block and distribution panel cover for use in telephone installation equipment and the like, wherein a base carries a distribution panel with a plurality of mushroom pins thereon and normal thereto at predetermined spacing intervals and also carries a plurality of terminal blocks in parallel rows having fixed, predetermined sidewise spacing between adjacent, independent, parallel terminal blocks, each terminal block having parallel longitudinal side walls, the parallel rows of terminal blocks running normally to the distribution panel and terminating adjacent to the distribution panel at one end of each row, the predetermined spacing of the parallel rows of terminal blocks corresponding to the spacing of the mushroom pins such that a pair of mushroom pins is spaced on the distribution panel with one pin near each of the opposite longitudinal sides of each row of terminal blocks, wherein the improved cover comprises:

(a) a flat top of width greater than the width of one of said terminal blocks and greater than the distance between the opposite edges of said pair of mushroom pins at the end edge of the terminal block, a first portion of the top extending sidewise at a first side of the terminal block for a predetermined first distance, and a second portion extending sidewise at a second and opposite side of the terminal block for a second predetermined distance, said first and second predetermined distances substantially equalling the predetermined distance between said adjacent parallel terminal blocks for cooperative full coverage of the space between adjacent, parallel, independent terminal blocks by a pair of said terminal block covers on adjacent terminal blocks;

(b) a plurality of snap tabs depending from the inner surface of the flat top inwardly of the flat top side edges in positions providing frictional engagement of the snap tabs with the side walls of the terminal block when the cover is pressed against the block; and

(c) mushroom pin engaging means located on the inner surface of the flat top on said first and second portions of the top for frictionally engaging the top to a pair of mushroom pins.

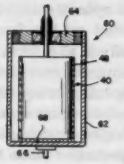
4,104,704

CAPACITOR INCLUDING AN ELECTROPLATED LAYER THEREOVER

Charles A. Weaver, Indianapolis, Ind., assignor to P.R. Mallory & Co. Inc., Indianapolis, Ind.

Division of Ser. No. 536,013, Dec. 23, 1974, Pat. No. 4,000,046. This application Oct. 13, 1976, Ser. No. 731,876
Int. Cl.[2] H01G *9/00*
U.S. Cl. 361—433 10 Claims

1. A capacitor comprising a film-forming metal anode, a dielectric oxide layer over anode, a semiconductive layer over oxide layer, a conductive layer over semiconductive layer, and an electroplated layer containing a metal and having a thickness of at least about 0.008 inches over conductive layer



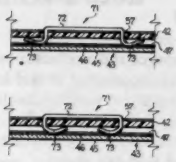
whereby the capacitor is resistant to mechanical shock and termination means are welded to electroplated layer.

4,104,705

PHOTOFLASH LAMP ARRAY HAVING SHIELDED SWITCHING CIRCUIT

Victor A. Levand, Jr., Lyndhurst, Ohio, and William A. Lenkner, Neoga, Ill., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 13, 1977, Ser. No. 805,770
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—5 7 Claims



1. A multiple flash lamp array comprising a plurality of flash lamps of the electrically fired type, a circuit board having circuitry on one side thereof for sequentially firing said lamps, means electrically connecting said lamps to said circuitry, and an electrically conductive shield in the form of a conductive sheet member positioned substantially parallel to and spaced from at least a part of the opposite side of said circuit board, said circuitry including at least one electrical ground circuit run on said one side of the board, and means electrically connecting said shield to said circuit run comprising a staple of conductive material having a pair of legs extending through said circuit board and having a center region positioned over and against a portion of said circuit run, said legs being bent at said opposite side of the circuit board so as to hold said center section of the staple against said circuit run, at least one of said legs of the staple being in contact against said shield.

4,104,706

PHOTOFLASH LAMP ARRAY HAVING CONDUCTIVE REFLECTOR

James M. Hanson, Euclid; Stanley S. Palagyi, Conneaut, and Gerald W. Povall, Highland Heights, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 655,005, Feb. 4, 1976, abandoned. This application Jun. 10, 1977, Ser. No. 805,317
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—10 12 Claims

1. A multiple flash lamp array comprising a plurality of electrically fired flash lamps each having a pair of lead-in conductors, a circuit board containing thereon circuitry for sequentially firing said flash lamps, means electrically connecting said lead-in conductors of the flash lamps to said circuitry, a reflector unit positioned between said lamps and said circuit board and shaped to define individual concave reflectors fac-

ing the front thereof for reflecting light from said lamps frontwardly of the array when flashed, said reflector unit comprising electrically insulating material having a coating of electrically conductive material on the front surface thereof, an opening through said reflector unit, and an electrical ground conductive area carried on the front of said circuit board behind and substantially in alignment with at least a portion of the edge of said opening, the rear surface of said reflector unit at said edge of the opening being adjacent to or against said electrical ground conductive area, said conductive coating on the front of the reflector being against or adjacent to said electrical ground conductive area to provide an electrical connection for electrostatic charges between said electrical ground conductive area and said conductive coating on the reflector.

4,104,707

ELECTRONIC FLASHLIGHT FOR DIRECT AND INDIRECT FLASHING

Arthur Schneider, Völkenrode, Germany, assignor to Rollei-Werke Franke & Heidecke, Germany

Filed Aug. 8, 1977, Ser. No. 822,561

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 7626537[U]

Int. Cl.² G03B *15/02*

U.S. Cl. 362—17 **7 Claims**

1. In a light-generating electronic flashlight including a housing, a light source and a reflector mounted in said housing, primary disc means connected to said housing and being movable among a plurality of positions including one position in a light path between the reflector and an object to be illuminated from the light source, the light source being disposed between said reflector and said one position, comprising,

secondary disc means movable to and from said one position for unilateral deflection of the light from said light source in at least one of a plurality of selectable directions, and upon the light source pointing in the selected direction.

4,104,708

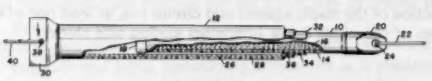
SHROUDED CHEMICAL LIGHT SOURCE

William H. Bohli, Catonsville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 8, 1974, Ser. No. 486,556

Int. Cl.² F21V *9/16*

U.S. Cl. 362—34 **7 Claims**



1. Self-luminescent article comprising an opaque tubular shroud and a chemiluminescent device which comprises a light transmitting tubular body having closed ends, said tubular body containing a chemiluminescent material;

said chemiluminescent device being in telescopic relationship with said shroud and reciprocally moveable therein, one end of said device being contained within said shroud and the other end being exposed, said end of the device contained within said shroud having a portion of larger cross-sectional area than the remainder of said device contained within said shroud, said shroud being provided with a stop means which cooperates with said enlarged end of the chemiluminescent device to prevent the complete removal of said chemiluminescent device from said shroud.

4,104,709

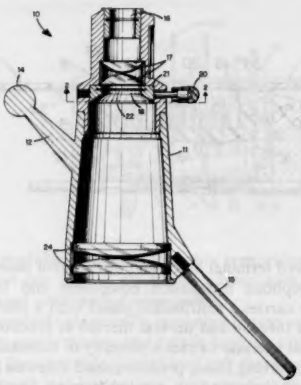
SURGEONS HEADLIGHT WITH CONTINUOUSLY VARIABLE SPOT SIZE

Jacobus Kloots, Sturbridge, Mass., assignor to Applied Fiberoptics, Inc., Southbridge, Mass.

Filed Apr. 11, 1977, Ser. No. 786,283

Int. Cl.² F21C *15/14*

U.S. Cl. 362—105 **8 Claims**



1. A surgeon's headlight for providing a variable diameter illuminating spot comprising:

(a) a lamp housing;

(b) means to secure said housing to a headband;

(c) a fiberoptic cable receptacle in said housing;

(d) a fixed entrance condenser lens following said receptacle in said housing;

(e) a variable iris proximate said entrance condenser lens in said housing;

(f) a fixed exit lens following said iris in said housing arranged to image said iris in a field 25 to 45 cm in front of said housing; and,

(g) manipulatable means connected to said iris and extending through said housing for varying the aperture of said iris, said condenser lens having a configuration and position to provide magnification of the exit pupil at said receptacle so as to illuminate the entire entrance surface of said exit lens, whereby changing the diameter of said iris will change the diameter of an illuminated spot without changing illuminance.

4,104,710

PATIENT HEADWALL UNIT

Frank M. Damico, Stevens Point, and Patrick John O'Toole, Wisconsin Rapids, both of Wis., assignors to Joerns Furniture Company, Division of American Seating Company, Stevens Point, Wis.

Filed May 31, 1977, Ser. No. 801,735

Int. Cl.² A47B *97/00*

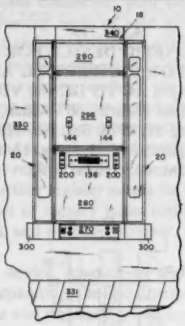
U.S. Cl. 362—130 **41 Claims**

1. A patient headwall unit adapted for positioning against the headwall of a patient room in a hospital or like facility between two beds, such unit comprising:

a generally rectangular, vertically elongated central section having means therein for accommodating electrical services and means for making such services available at the exterior of the unit for use at either of said beds;

a vertically elongated lighting section integral with and affixed to either side of said central section, each said lighting section being of heighth generally equal to said central section, each said lighting section including a reading light, a general room illumination light and means for directing the light rays from said reading light down-

wardly, outwardly and forwardly onto the upper section of the bed positioned adjacent thereto; and



means for switching said reading and general room illumination lights on and off.

4,104,711

AIRPORT LIGHT FIXTURE

Herbert F. Carter, Simsbury, Conn., assignor to Connecticut International Corporation, Windsor Locks, Conn.

Filed May 25, 1977, Ser. No. 800,183

Int. Cl.² F21S 1/02

U.S. Cl. 362—153 **5 Claims**

1. In an airport light fixture having a support member provided with a spherical support surface, a lamp base provided with a mating spherical support surface engaging the spherical support surface of the support member to form a universal joint therebetween for adjusting the tilt of the lamp base, a lamp mounted on the lamp base and a lens cooperating with said lamp base to cover the lamp and direct the light emanating therefrom, and means for clamping the spherical support surfaces of said lamp base and support member together, the improvement wherein said spherical support surfaces have different curvatures to minimize the area of contact therebetween to concentrate the clamping forces on the contacting areas to prevent the relative movement of the lamp base and the support member under the severe vibrational stress encountered in use.

4,104,712

OUTDOOR LIGHT FIXTURE

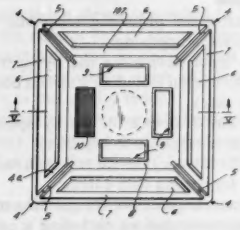
Erich Häfner, Doktorkamp 11, Leopoldshöhe, Fed. Rep. of Germany (D-4811)

Filed Feb. 1, 1977, Ser. No. 764,639

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 2604840

Int. Cl.² F21S 2/00

U.S. Cl. 362—218 **10 Claims**



1. A light fixture, comprising a one-piece hollow truncated pyramidal frame with an open base, said frame including an end wall located opposite said base and elongated sloping corner sections extending from said base to said end wall, each of said sections including two legs and a partition extending into the interior of said frame, disposed between and making an acute angle with each of said legs, said frame having a plurality of first ventilating openings in the region of said end wall; a discrete light-transmitting pane for each of said corner sections, said panes being located in the interior of said frame between neighboring corner sections and each having two sloping marginal portions, one of which sealingly engages one leg and abuts against the partition of one of the neighboring sections and the other of which sealingly engages one leg and abuts against the partition of the other neighboring section; and a one-piece cover overlying said base, said fixture having a plurality of second ventilating openings in the region of said cover and each of said first and second openings being sufficiently small to prevent insects, particularly nocturnal insects, from entering the interior of the fixture.

4,104,713

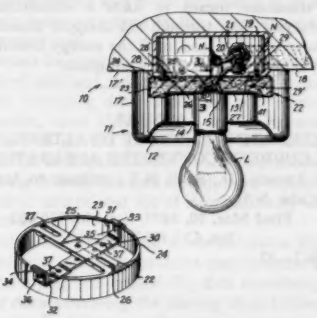
HEAT DISSIPATING LIGHTING FIXTURE MOUNT

Kingsley Chan, Rutherford; Mahendra K. Patel, Carteret, and Sidney Wolkin, Rahway, all of N.J., assignors to Lightolier Incorporated, Jersey City, N.J.

Filed May 2, 1977, Ser. No. 792,722

Int. Cl.² F21V 29/00

U.S. Cl. 362—294 **6 Claims**

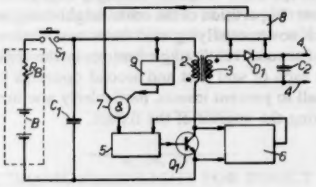


1. A heat dissipating lighting fixture adapted to be mounted to a junction box having spaced mounting screws extending into said box comprising, in combination, a housing including a top plate member, a light socket mounted on said plate member, a mounting ring assembly adapted to connect said housing to said junction box, said ring assembly including a horizontally directed annular rim, a mounting bar at the upper edge of said ring assembly, said bar including spaced elongate aperture means for receiving said mounting screws of said junction box to hold said bar to said box, a housing support bracket movably mounted to said ring assembly, said bracket extending diammetrically of said ring assembly in parallel spaced relation to said bar, said bracket including at each of its longitudinal extremities means releasably and rotatively to support said bracket with respect to said ring assembly, whereby said bracket may be rotated relative to said ring assembly but is locked against substantial movement in directions normal to the plane of said rim, heat insulation means disposed in said ring assembly between said bracket and said bar and fastener means on said bracket adapted to be received in complemental fastener means on said top plate of said housing, whereby said bracket is clampingly engaged against said top plate, said assembly providing an elongate heat conducting path from said housing to said junction box, said path extending through said bracket to said rim and from said rim to said bar.

4,104,714
CONVERTER ARRANGEMENTS

Richard Hanley Smith, Cirencester, and Peter Graham Laws, Wootton Bassett, both of England, assignors to Plessey Handel und Investments AG., Zug, Switzerland

Filed Jan. 14, 1977, Ser. No. 759,477
Claims priority, application United Kingdom, Jan. 14, 1976, 1472/76; Feb. 13, 1976, 5709/76
Int. Cl.[2] H02M *3/335*
U.S. Cl. 363—21 18 Claims

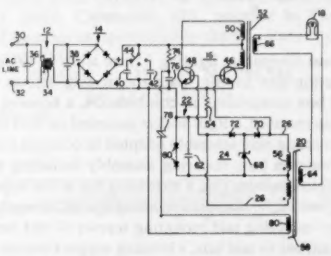


1. A DC/DC converter comprising a transformer means having a primary and a secondary circuit, a chopper transistor means for periodically interrupting current flow in said primary circuit to effect energy transfer into said secondary circuit when the current flow in the primary circuit is interrupted, first and second current flow sensing means in said primary and secondary circuits respectively, and means for interconnecting said first and second current flow sensing means with said chopper transistor means to form a relaxation oscillator wherein current flow through the chopper transistor means remains interrupted at least until the energy transfer into said secondary circuit is substantially complete.

4,104,715
ALTERNATING CURRENT TO ALTERNATING CURRENT CONVERTER APPARATUS

Harry W. Lawson, Jr., Rush, N.Y., assignor to Acme Electric Corp., Cuba, N.Y.

Filed Mar. 10, 1977, Ser. No. 776,403
Int. Cl.[2] H02M *5/458*
U.S. Cl. 363—37 19 Claims



1. Alternating current to alternating current converter apparatus which provides controlled alternating current to a load, said apparatus comprising

(a) means for converting input alternating current into direct current,

(b) means for inverting said direct current into alternating current and applying said alternating current therefrom to said load, said inverting means comprising

(1) oscillator means connected in current feedback relationship with said load for self excitation thereof by said load current,

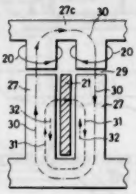
(2) means for sensing the output current of said oscillator and providing a control voltage, and

(3) means responsive to said control voltage for reducing said oscillator output current without cutting off said oscillator output current when said control voltage exceeds a predetermined magnitude.

4,104,716
SATURABLE MAGNETIC DEVICE FOR REGULATING COMMUTATING OR CONVERTING AN ELECTRIC CURRENT FROM AC TO DC OR VICE VERSA

Luigi Ruggeri, Via Mosé Bianchi, 40 - Milan, Italy

Filed Aug. 11, 1976, Ser. No. 713,602
Claims priority, application Italy, Aug. 13, 1975, 26329 A/75
Int. Cl.[2] H02M *5/32*
U.S. Cl. 363—102 4 Claims



1. A saturable magnetic device for regulating, commutating or converting an electric current, comprising a magnetic circuit including a ferromagnetic laminated core with at least one slot having saturable slot walls, at least one conductor arranged in said slot, said conductor conducting said electric current and having an elongated cross-sectional shape to minimize the conductor inductance and to enhance the conductor added resistance due to stray flux from a current passing through the conductor when the slot walls are unsaturated, means on said core for applying an external magnetic control field to said magnetic circuit to saturate the slot walls and reduce thereby the stray flux and the conductor added resistance according to a prefixed program.

4,104,717
AUTOMATIC SYSTEM FOR PROVIDING TELEPHONE NUMBER INFORMATION SERVICE

Eiji Fujimura, 24-4, Shinohara-dai-machi, Kohuku-ku, Yokohama, Japan

Continuation of Ser. No. 642,760, Dec. 22, 1975, Pat. No. 4,020,473, which is a continuation-in-part of Ser. No. 396,306, Sep. 11, 1973, abandoned, which is a continuation of Ser. No. 162,236, Jul. 13, 1971, abandoned, which is a continuation-in-part of Ser. No. 834,226, Jun. 11, 1969, abandoned, which is a continuation-in-part of Ser. No. 730,973, Apr. 25, 1968, abandoned, which is a continuation-in-part of Ser. No. 438,325, Mar. 9, 1965, abandoned. This application Aug. 17, 1976, Ser. No. 715,000
Claims priority, application Japan, Mar. 11, 1964, 39-13453
The portion of the term of this patent subsequent to Apr. 26, 1994, has been disclaimed.
Int. Cl.[2] G06F *7/10, 15/02, 15/40*
U.S. Cl. 364—200 6 Claims

1. An apparatus for providing telephone numbers in response to inquiries, comprising:

at least one input device for use by operators to supply inquiry information including a format control symbol for an inquiry index;

at least one output device for use by operators to receive information in response to inquiries;

at least one file memory device to which random access can be gained for storing data entries;

at least one central processor for carrying out mathematical and logical computations including a comparing operation, said central processor having:

an index shaping device coupled to said input device and comprising:

(a) detector switching means for identifying breaks between

items in the inquiry information and switching the items to registers for each of said items,

(b) register means connected with said detector switching means for storing each of said items, and limiting the number of characters as to any needed one of said items,

(c) conversion means connected to said detector switching means for converting each of the needed items into a corresponding generic concept code,

(d) a further register means connected to said conversion means for storing each of said generic concept codes,

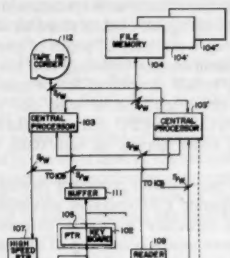
(e) integrating register means connected to said register means and further register means for integrating each item to shape a set of inquiry items comprised of the inquiry index, a desk and question number, and a format control symbol, and,

(f) a dividing device coupled to said integrating register means for separating the inquiry index from said set of inquiry items and registering said inquiry index,

a joining device coupled to the dividing device and the output channel of said file memory device to receive and combine the set of inquiry items with response data from the file memory device, and

a comparison device, which comprises:

(a) a random access storage means having storage cells to store keywords that are prepared in the same format as the inquiry index item, and having a control unit,



(b) a further storage means to store area-unit numbers corresponding to said keywords and having storage cells corresponding to the storage cells in said random access storage means on a one to one basis,

(c) comparing means coupled to both said storage means to determine the position of an inquiry index among a plurality of keywords stored in the random access storage means which respectively correspond to the storing areas of the file memory device,

(d) address calculating means connected to the comparing means and the control unit of the random access storage means for calculating the memory address of a next keyword in accordance with a result of a latest comparison with respect to the inquiry index,

(e) keyword registering means coupled between said random access storage means and said comparing means for receiving and storing the keyword for the next comparison step, and

(f) area-built number registering means connected to the file memory device for receiving and storing area-unit numbers corresponding to the keywords, and for transmitting the contents thereof to the file memory device at the time of determination of the inquiry index position among the keywords.

4,104,718

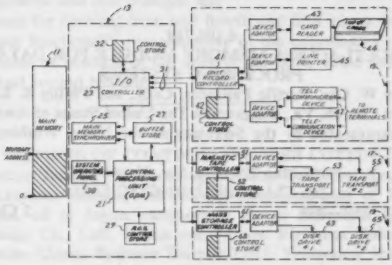
SYSTEM FOR PROTECTING SHARED FILES IN A MULTIPROGRAMMED COMPUTER

Alain Poublan, Paris, France; Charles Bachman, Lexington, and Jacques Bouvard, Wellesley, both of Mass., assignors to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Filed Dec. 16, 1974, Ser. No. 533,038

Int. Cl.[2] G06F *9/19, 7/10, 3/00*

U.S. Cl. 364—200 **10 Claims**



1. Apparatus for selectively permitting access to a related file of information by a candidate job step in a queue of job steps stored in preparation to be processed by a computing system, the related file including information related to the processing of said candidate job step by the computing system and information related also to the processing of an active job step currently being processed by the computing system, said apparatus comprising:

(a) first means for storing a request file control manifestation associated with said candidate job step, said request manifestation including data identifying said related file of information, data identifying a set of requested rules which are to govern the sharing of said related file of information as said candidate job step is processed by the computing system, and data identifying a requested use to be made of said related file of information by said candidate job step;

(b) second means for storing a current-status file control manifestation, said current-status manifestation including data identifying said related file, data identifying a set of current rules governing the sharing of said related file of information, and data identifying a current use being made of said related file of information by said active job step currently being processed by the computing system;

(c) third means coupled to said first and second means for comprising said request control manifestation with said current-status control manifestation;

(d) fourth select control means coupled to said first and second means, for making a first determination whether the requested use as identified by the data of said request structure manifestation violates one of the current rules as identified by the data of said current-status manifestation, and for selectively permitting access to said related file of information by said candidate job step in accordance with said first determination;

(e) fifth select control means coupled to said first and second means, for making a second determination whether the current use as identified by the data of said current manifestation violates of the requested rules as identified by the data of said request manifestation, and for selectively permitting access to said related file of information by said candidate job step in accordance with said second determination; and

(f) sixth means coupled to said first and second means, for entering in said first means, when access to said related file by said candidate job step is granted in accordance with at least one of said first and second determinations of said fourth and fifth means, the requested rules as identified by said request manifestation as said current rules, and for

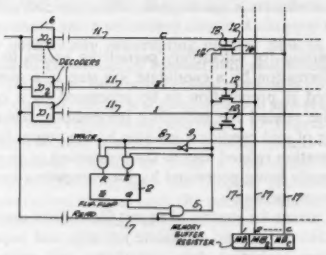
entering in said second means said requested use as indicated by said request manifestation as said current use as identified by said current-status manifestation, thereby to determine the use by said candidate job step of said related file of information.

4,104,719

MULTI-ACCESS MEMORY MODULE FOR DATA PROCESSING SYSTEMS

Wesley W. Chu, Pacific Palisades, Calif., and Phillip B. Korff, Falls Church, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 20, 1976, Ser. No. 687,977
Int. Cl.[2] G06F 13/00; G11C 7/00
U.S. Cl. 364—200 **2 Claims**



1. Multi-access memory apparatus for use with a digital data computer system of a type having a memory formed of a plurality of memory modules each containing data bit storage cells, the computer system further including a digital data processor providing address instructions to address registers, the outputs of which are applied to decoders functioning responsively to said instructions to activate particular storage cells of a particular module and permit the logic state of said particular cells to be supplied for storage to memory buffer registers, the memory apparatus comprising:

a plurality of independent memory access channels for each of said data bit storage cells of each of the modules, each of said channels including:

an address register having an input coupled to said processor for receiving said processor provided address instructions and an output,

an address instruction decoder having an input coupled to said address register output and an output,

an individual electrically-conductive drive line coupled to and electrically activated by said decoder output,

an individual memory buffer register for receiving the logic contents of the storage cell of the channel,

a normally-open data-bit-line circuit coupling said buffer register to said data bit storage cell of the channel,

said data-bit-line circuit including a normally-open switch means, and

conductive means coupling said drive line to said normally-open switch means when said decoder functions for activating the drive line, said activating closing said switch means and permitting said logic state of said cell to be supplied through said data-bit-line circuit to said buffer register,

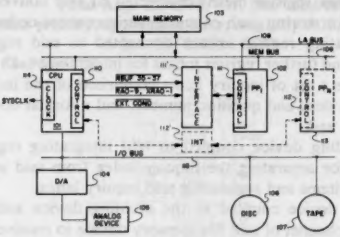
said plurality of channels for each cell permitting simultaneous accessing of the logic state of said cell whereby identical address instructions calling for the same storage cell locations can be simultaneously serviced.

4,104,720

CPU/PARALLEL PROCESSOR INTERFACE WITH MICROCODE EXTENSION

Ronald Hans Gruner, Cary, N.C., assignor to Data General Corporation, Westboro, Mass.

Filed Nov. 29, 1976, Ser. No. 745,898
Int. Cl.[2] G06F 9/16
U.S. Cl. 364—200 **10 Claims**



1. In an improved data processing system including a main memory for storing at least said data, peripheral device means for providing inputs to and outputs from said system, a CPU connected from said main memory for processing certain of said data, said CPU including clock means for providing timing signals for operation of said system and a system controller for controlling operation of said system, said system controller including a microprogram control store for storing a microprogram and having a plurality of pages of predetermined word length, said system further including I/O bus means connected from said CPU to said peripheral device means for transferring said data therebetween, and at least one parallel processor connected between said CPU and said main memory for parallel processing other certain of said data, the improvement comprising:

said at least one parallel processor having associated therewith a separate CPU/parallel processor interface structure, said structure including extended microprogram control store means consisting of extension of said predetermined word length of at least one of said pages and having stored therein an extension of said microprogram for controlling operation of said at least one parallel processor;

means responsive to the operation of said system controller controlling said system from the portion of said microprogram contained within said predetermined word length of said at least one of said pages and synchronized with said clock means for enabling the operation of said extended microprogram control store means;

whereby the speed of operation of said system is increased since said at least one parallel processor operates upon said other certain of said data under control of said extended microprogram simultaneously and synchronously with operation of said CPU.

4,104,721

HIERARCHICAL SECURITY MECHANISM FOR DYNAMICALLY ASSIGNING SECURITY LEVELS TO OBJECT PROGRAMS

Peter Willy Markstein, and Alan Levi Tritter, both of Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,899
Int. Cl.[2] G06F 9/18
U.S. Cl. 364—200 **23 Claims**

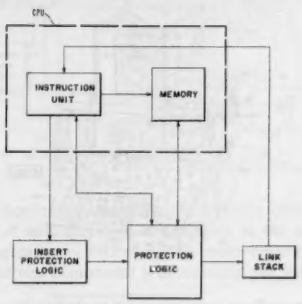
1. An electronic computing system having a hierarchical security mechanism incorporated therein, said system including a memory for storing both instructions and data, an instruction execution unit for extracting series of instructions from the memory and executing same, and a processing unit for performing the data operations required by said instructions, said

hierarchical security mechanism being dynamically actuable by application programs and including

means actuable by an application programmer for assigning a hierarchical protection level for each program instruction sequence included in an overall running program, wherein successive hierarchical protection levels have successively reduced privelege to access storage locations in said memory,

means for assigning a unique protection field to each such instruction sequence,

means for storing the particular protection field assigned to



each instruction sequence in every storage location in said memory to which it is intended that access by said instruction sequence is to be permitted, and

means actuable during the running of a program for ascertaining that the protection field of each memory access matches the protection field of the instruction sequence which initiated said access, which comprises means for comparing the protection field of a requesting instruction with the stored protection field of the accessed location in memory and predicating access on a successful comparison, said comparison being a function of the hierarchical protection level of the requesting instruction.

4,104,722

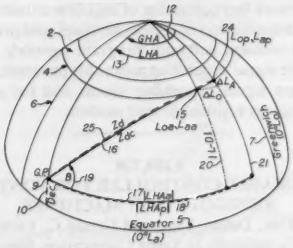
METHOD AND APPARATUS FOR CELESTIAL NAVIGATION

Dow J. Evans, 6525 Hillcroft, Apt. 503, Houston, Tex. 77036

Filed Sep. 10, 1976, Ser. No. 722,085

Int. Cl.[2] G06F *15/50*

U.S. Cl. 364—455 **24 Claims**



1. An apparatus for celestial navigation, comprising

means for deriving a first input functionally representative of the observed altitude of a selected celestial body,

means for deriving a second input functionally representative of the geographical coordinates of an assumed position,

means for deriving a third input functionally related to the ground position of said celestial body,

means for deriving from said second and third inputs a fourth input functionally representative of a first right spherical triangle having the apex of one of its acute angles at said ground position of said body and its hypotenuse between said ground position and said assumed position,

means for deriving from said first and third inputs a fifth input functionally representative of a second right spherical triangle proportional to said first triangle and having the apex of its corresponding angle at said ground position and its hypotenuse extending therefrom along the hypotenuse of said first triangle, and

means for deriving from said fourth and fifth inputs an output functionally representative of the coordinates of the point of position of the apex of the other acute angle of said second triangle.

4,104,723

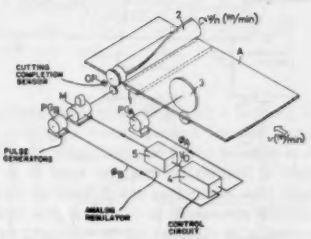
METHOD OF CONTROLLING WEB CUTTING

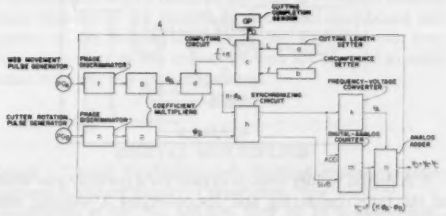
Masateru Tokuno, Nishinomiya; Hisahiro Tanigawa, Koganei; Masayoshi Kaneko, and Noboru Shinmura, both of Yokohama, all of Japan, assignors to Rengo Kabushiki Kaisha (Rengo Co., Ltd), Osaka and Nippon Riraiansu Kabushiki Kaisha (Japan Reliance Electric Ltd.), Yokohama, both of, Japan

Continuation-in-part of Ser. No. 597,815, Jul. 21, 1975, abandoned. This application Feb. 17, 1977, Ser. No. 769,846

Int. Cl.[2] G05B *19/26;* **B26D** *5/20*

U.S. Cl. 364—475 **2 Claims**





1. A method for controlling the cutting of a continuously fed web by means of a rotary cutter, comprising the steps of:

generating a signal representative of the circumference of said rotary cutter;

generating a signal representative of a predetermined length into which the web is to be cut;

detecting the speed of the web and generating a signal representative thereof;

detecting the speed of the rotary cutter and generating a signal representative thereof;

dividing said signal representative of the circumference of said rotary cutter by said signal representative of the predetermined cutting length to produce a coefficient K;

multiplying said signal representative of the speed of the web by the coefficient K;

comparing said multiplied signal and said signal representative of the speed of said rotary cutter to determine any difference between them;

converting the result of said determination to an analog error voltage;

converting said multiplied signal to a reference voltage proportional thereto;

combining said reference voltage with said error voltage, and

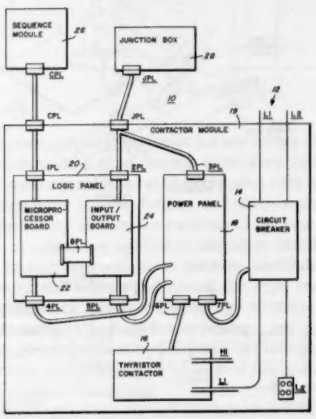
controlling the speed of said rotary cutter by the combined voltage, thereby cutting the web accurately into the predetermined lengths.

4,104,724

DIGITAL WELDER CONTROL SYSTEM

James Allen Dix, Greenfield; Marvin A. Guettel, Milwaukee, and Michael Aslin, Cedarburg, all of Wis., assignors to Square D Company, Park Ridge, Ill.

Filed Jun. 27, 1977, Ser. No. 809,959
Int. Cl.[2] G06F *15/46*; B23K *9/12*
U.S. Cl. 364—477 **9 Claims**



1. A digital welder control system for a portable gun welder of the type connecting and disconnecting a welding transformer load from an electrical source to control the timing periods of the welding sequence and the level of heat intensity in the weld, comprising:

a means responsive to manual actuation for producing a plurality of output signals representing timing period and weld heat constants of the welding sequence;

a sensing means responsive to the end of current conduction in each half-cycle of a welding period for generating an automatic power factor signal having a timing point which varies with changes in the power factor of the welding installation; and

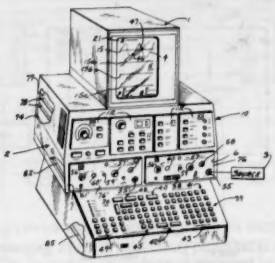
a digital control means, responsive to the heat, period, and automatic power factor signals and having a fixed and known cycling time to execute a particular instruction so that by placing the control means in a programmed loop after the automatic power factor signal is sensed, a real time delay is produced, for generating a digital phase shift heat control weld firing signal and for generating each of the timing periods within the weld sequence.

4,104,725

PROGRAMMED CALCULATING INPUT SIGNAL MODULE FOR WAVEFORM MEASURING AND ANALYZING INSTRUMENT

Frederick A. Rose; Russell H. Nord, and Roger E. Lidicker, all of Fort Atkinson, Wis., assignors to Norland Corporation, Fort Atkinson, Wis.

Filed Mar. 26, 1976, Ser. No. 670,891
Int. Cl.[2] G01R *13/20*
U.S. Cl. 364—487 **19 Claims**



1. A waveform measuring and analyzing instrument having a visual display output means and a digital memory array means for storage of the coordinates of a digital representation of a waveform, a data acquisition means connected to said memory array means for establishing digitized waveform signals of a waveform, a programmed processor having a program memory and an interactive user operated control means for the processor for programmed data reduction of the data in the memory array means, the improvement in the data acquisition means comprising a releasably connected signal coupling unit in said instrument having a first bus connection means including a hardware bus connector and a software bus connector connected to the processor and to the data acquisition means, plug-in modules having a single integrated support having second connection means including a hardware bus connector and a software bus connector for connection to said first bus connection means, said integrated support being insertable as a unit into said coupling unit and establishing the interconnection of said corresponding connectors, said plug-in unit including a resident software program means connected to the software bus connector of said plug-in module and a hardware signal processing means connected to the hardware bus connector of said plug-in module, said hardware bus connector and said software bus connector of said first connection means establishing transmission of signals between said processor and said module resident software program memory means and said hardware signal processing means for processing of data in said hardware signal processing means and for executing a software program resident in said module.

4,104,726

PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINES

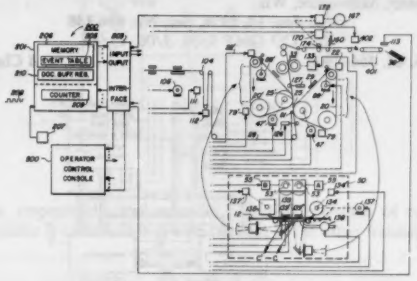
Bernard C. Fisk, Dallas, Tex., and Gerald C. Verschage, Henrietta, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 496,663, Aug. 12, 1974. This application Nov. 3, 1975, Ser. No. 628,035
Int. Cl.[2] G06F *15/20*; G03G *15/00*
U.S. Cl. 364—518 **5 Claims**

1. In a synchronous reproduction machine for producing impressions of variable size and quantity from an original, the reproduction machine having a photosensitive member and a plurality of discrete operating components cooperable with one another and the photosensitive member to electrostatically produce impressions on support material, the improvement comprising:

programming means for programming the machine to produce the impressions desired;

control means for operating said components in timed relationship with one another to produce the desired impressions in accordance with said programing means; and



component monitoring means for periodically checking at least one of said operating components in the intervals between actuation of said operating components to determine if said one component is functioning properly.

4,104,727

LIQUID CRYSTAL DISPLAY CALCULATOR CONSTRUCTION

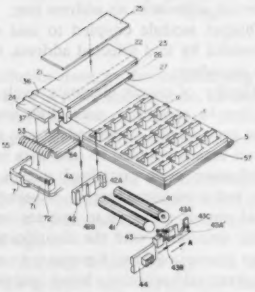
Isamu Washizuka, Kyoto; Shintaro Hashimoto, Nara; Masaru Kakumae, Yamatokoriyama; Yuuichi Sato, Nara; Isao Fujisawa, Yamatokoriyama; Yukihiro Inoue, Kashihara; Sadakatsu Hashimoto, Yamatokoriyama; Yoshio Takeda, Nara; Mitsuo Ishii, Yamatokoriyama, and Yoshitomo Kitanishi, Kashihara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 23, 1976, Ser. No. 725,928

Claims priority, application Japan, Sep. 23, 1975, 50-115190; Sep. 23, 1975, 50-115191; Sep. 23, 1975, 50-115192; Sep. 23, 1975, 50-115193

Int. Cl.[2] G06F *15/02;* G02F *1/13*

U.S. Cl. 364—710 **22 Claims**



1. An electronic calculator comprising:

keyboard means having a plurality of integral key actuators for introducing data into said calculator on which computations are to be preformed;

a data processor unit implemented with an LSI semiconductor chip for performing computation functions on the data introduced by said keyboard means;

a multi-digit liquid crystal display means for displaying data introduced by said keyboard means and results of the computation functions performed by said data processor unit, said liquid crystal display means having a portion with electrical terminals thereon which extends from one end of said display means and supports said LSI semiconductor chip thereon;

a printed circuit flexible film having electrical leaf conductors formed thereon in a predetermined pattern, said electrical leaf conductors having portions which define electrical key contacts for cooperation with said key actuators and terminals for interconnection with said terminals of said liquid crystal display; and

means for holding said electrical key contacts of said printed circuit flexible film in juxtaposition to said respective key actuators and said terminals of said film into contact with said terminals of said liquid crystal display.

4,104,728

ELECTRONIC APPARATUS EQUIPPED ON A FLEXIBLE SUBSTRATUM

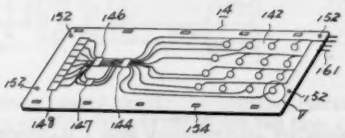
Takeshi Kasubuchi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 476,864, Jun. 6, 1974, abandoned. This application Nov. 4, 1976, Ser. No. 739,002

Claims priority, application Japan, Jun. 6, 1973, 48-63482

Int. Cl.[2] G06F *3/00;* H01H *9/00*

U.S. Cl. 364—712 **8 Claims**



1. An electronic apparatus comprising a housing, a flexible substratum carrying a wiring pattern formed thereon, said flexible substratum being disposed in the housing in a serpentine fashion at at least one portion thereof, a display unit formed directly on the flexible substratum, said display unit being adjustable with respect to its angle or its position thereof because of the flexibility of the substratum; a semiconductor circuit unit including at least a computation function circuit formed directly on the flexible substratum and protected from the environment with a resinous material; key contact patterns formed directly on the flexible substrate and a keyboard unit disposed on the flexible substratum, said keyboard unit containing a plurality of key contacts which are adapted to make contact with the key contact patterns.

4,104,729

DIGITAL MULTIPLIER

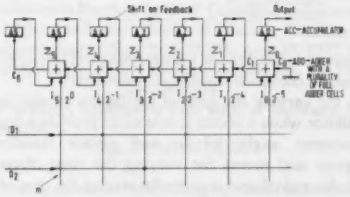
Michael J. Gingell, Sawbridgeworth, England, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 688,520, May 20, 1976, abandoned. This application May 16, 1977, Ser. No. 796,920

Claims priority, application United Kingdom, Aug. 27, 1975, 35345/75

Int. Cl.[2] G06F *7/52*

U.S. Cl. 364—757 **17 Claims**



1. A digital multiplier providing a calculated output signal comprising:

a first adder having a plurality of first adder cells;

an accumulator coupled to each of said first adder cells to store the output of each of said first adder cells and to shift said stored output one bit for each addition operation said calculated output signal being provided by said accumulator;

input means coupled to said first adder cells for applying simultaneously a plurality of serial data words to said first adder cells, said input means being arranged so that each of said serial words is applied to predetermined ones of said first adder cells but no two serial words are applied to the same one of said first adder cells;

first means coupled to said accumulator for examining a given number of the most significant bits of said calculated output signal to determine if the complete calculated output signal value will exceed a predetermined range of values; and

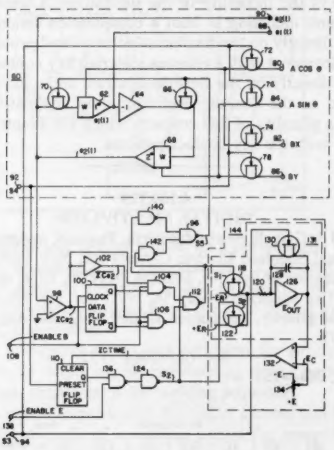
second means coupled to said accumulator and a given one of said first adder cells for substituting for said calculated output signal a selected one of a maximum positive and negative data signal according to the sign of said calculated output signal when the value of the latter exceeds said predetermined range of values.

4,104,730

BORESIGHT ADJUSTMENT FOR A HARMONIC OSCILLATOR COORDINATE CONVERTER

Steven Morrison, Baltimore, and William J. Dorman, Ellicott City, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 2, 1976, Ser. No. 672,894
Int. Cl.[2] G06G *7/22, 7/80*
U.S. Cl. 364—815 **11 Claims**



6. Resolver apparatus for transforming vectors comprising:

a harmonic oscillator coordinate converter;

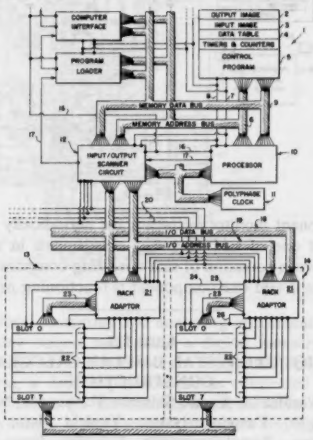
means for varying the time of oscillation of said harmonic oscillator when a vector is rotated to provide a coordinate adjustment angle $\Delta\theta$ to said vector transformation wherein said means for varying the time of oscillation includes a clock and counter for storing the time of oscillation and means for adjusting the value stored in the counter by an amount indicative of the adjustment angle $\Delta\theta$.

4,104,731

ASYNCHRONOUS COUPLING OF DATA BETWEEN A WORD-ORIENTED I/O MODULE AND THE MEMORY OF A PROGRAMMABLE CONTROLLER

Raymond A. Grudowski, South Euclid, and Odo J. Struger, Chagrin Falls, both of Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Jun. 14, 1976, Ser. No. 696,138
Int. Cl.[2] G06F *9/06, 3/00, 15/46*
U.S. Cl. 364—900 **8 Claims**



1. A programmable controller, the combination comprising:

a memory which includes a set of command words in a data table, which includes an output image table, and which includes a control program;

an input/output scanner circuit coupled to said memory and being operable to periodically read a command word from a selected location in said output image table out of said memory, to couple said command word to a data bus, and to generate a selected address which is associated with the selected location in said output image table and to couple said selected address to an address bus;

an input/output module coupled to said address bus and being enabled by said selected address, the input/output module including:

(a) a plurality of circuit elements, each coupled to said data bus to receive a multi-digit number contained within each of said command words; and

(b) circuit means coupled to said data bus to receive an identification code contained within each command word, and in response thereto, to selectively enable one of said circuit elements to operate on the multi-digit number associated with the identification code; and

a processor connected to said memory to execute said control program, said processor being operable in response to control program instructions to sequentially and selectively transfer command words from said data table to said selected location in said output image table.

4,104,732

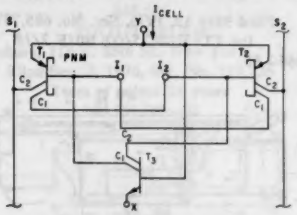
STATIC RAM CELL

Frank Wilson Hewlett, Jr., Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 2, 1977, Ser. No. 821,068
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—179 **4 Claims**

1. A storage cell comprising first and second multiple-

Schottky-collector switching transistors wherein a first collector of each is coupled to first and second sources of read/write



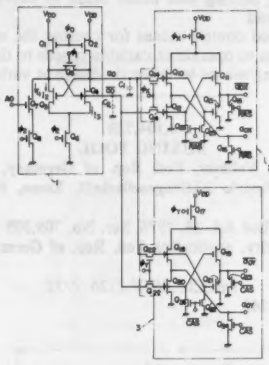
data, respectively, and wherein a second collector of each transistor is cross-coupled with the base of the other transistor.

4,104,733

ADDRESS SELECTING CIRCUITRY FOR SEMICONDUCTOR MEMORY DEVICE

Takashi Satoh, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 15, 1977, Ser. No. 824,740
Claims priority, application Japan, Aug. 23, 1976, 51-99685
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—189 **9 Claims**



1. In a semiconductor memory device including a matrix of memory cells arrayed in rows and columns, an address selecting circuitry for driving row and column decoder circuits connected with said rows and columns respectively, comprising:

an address signal setting circuit for receiving an address input signal to produce at their output nodes two selected different address setting signals in accordance with said address input signal;

a row decoder driving circuit having two input nodes thereof coupled with the two output nodes of said address signal setting circuit respectively and two output nodes thereof coupled with said row decoder circuit, said row decoder driving circuit being responsive to a row decoder drive timing signal to produce at the two output nodes thereof two different row decoder driving signals corresponding to said two address setting signals respectively; and

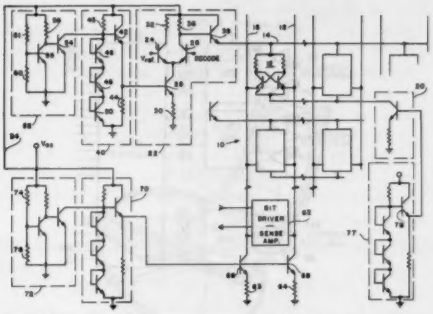
a column decoder driving circuit having two input nodes thereof coupled with the two output nodes of said address signal setting circuit respectively and two output nodes thereof coupled with said column decoder circuit, said column decoder driving circuit being responsive to a column decoder drive timing signal to produce at the two output nodes thereof two different column decoder driving signals corresponding to said two address setting signals respectively.

4,104,734

LOW VOLTAGE DATA RETENTION BIAS CIRCUITRY FOR VOLATILE MEMORIES

William H. Herndon, Sunnyvale, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Jun. 30, 1977, Ser. No. 811,806
Int. Cl.[2] G11C *11/40, 13/00*
U.S. Cl. 365—228 **6 Claims**



1. Memory control circuitry for supplying operating bias and for controlling the removal of said bias from a volatile memory without loss of data therefrom, said memory having at least one row and column of binary storage cells respectively coupled to a corresponding number of word lines and bit line pairs, said memory control circuitry including:

word driver circuitry coupled to each of said word lines, said driver circuitry having biasing means for applying a normal standby bias level to said word line and having switching means responsive to a decoder signal for applying an address voltage level to said word line;

word driver bias circuitry coupled to said word driver circuitry, said word driver bias circuitry having bias determining means for establishing a predetermined bias voltage level and for applying said voltage level to said word driver circuitry for the control of said biasing means;

cell current bias circuitry coupled to each cell in a row of cells in said memory, said cell current bias circuitry having means for establishing a predetermined bias level for applying to each of said cells the minimum unaddressed power required to retain the data stored therein; and

first voltage sensing means coupled to said word driver bias circuitry and to the memory power supply voltage source for disabling said bias determining means when said voltage sensing means detects a drop in power supply voltage to a first voltage level.

4,104,735

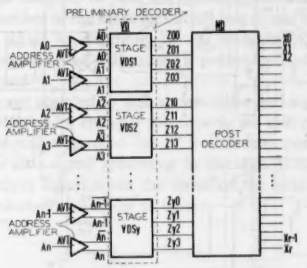
ARRANGEMENT FOR ADDRESSING A MOS STORE

Rüediger Hofmann, Munich, and Paul-Werner Von Basse, Wolfratshausen-Farchet, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation-in-part of Ser. No. 825,274, Aug. 17, 1977, and Ser. No. 825,225, Aug. 17, 1977. This application Sep. 14, 1977, Ser. No. 833,051
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1976, 2641524
Int. Cl.[2] G11C *8/00*
U.S. Cl. 365—230 **4 Claims**

1. An arrangement for addressing by use of address signals a MOS store having MOS transistor storage cells comprising: means for amplifying, inverting, and intermediately storing the address signals, means for feeding negated and non-negated

address signals to a decoder circuit means, drive lines connecting the decoder circuit to the storage cells, said decoder circuit means selecting a drive line in dependence upon prevailing address signals, said decoder circuit means comprising a preliminary decoder circuit and a post decoder circuit, said preliminary decoder circuit including a plurality of stages; for n address signals, means for supplying each of said plurality of stages with m different address signals in negated and non-negated form such that (n/m) stages are provided; each stage having 2^m output lines; means for marking the output lines of each stage in dependence upon address signal combinations



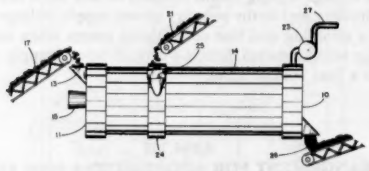
prevailing at the stages; output lines of the stages being connected to the post decoder circuit; the post decoder circuit having 2^n drive lines which connect to the storage cells; said post decoder circuit having logic-linking element means for logic-linking the drive lines to the output lines of the stages in such manner that each drive line can be selected by a different combination of an output line with respect to each stage via a logic-linking element; and means for feeding the remaining address signals to the post decoder circuit in negated and non-negated form in the event that the n address signals are divisible by n with a remainder, the drive lines being selected by said remaining address signals via logic-linking elements.

4,104,736

APPARATUS AND METHOD FOR RECYCLING USED ASPHALT-AGGREGATE COMPOSITION

Robert L. Mendenhall, 1770 Industrial Rd., Las Vegas, Nev. 89102

Filed Dec. 27, 1976, Ser. No. 754,312
Int. Cl.² E01C *19/10*
U.S. Cl. 366—2 **7 Claims**



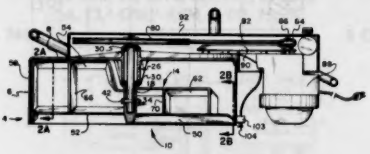
1. A process for heating asphalt-aggregate composition comprising directly exposing the composition to hot gases of hydrocarbon combustion to form a gaseous exhaust mixture comprising carbon dioxide, water vapor and hydrocarbon volatiles form heated asphalt, directing said gaseous mixture through a chamber to create centrifugal force on said gaseous mixture sufficient to separate said mixture into a first layer comprising said hydrocarbon volatiles, and a second layer comprising said carbon dioxide and water vapor, directing said first layer to a combustion chamber in which a flame and oxygen containing gas is introduced, and directing said second layer to atmosphere.

4,104,737

MIXER APPARATUS

Gerold Wayne Brailsford, 490 N. 970 East, Springville, Utah 84663

Filed May 13, 1976, Ser. No. 685,737
Int. Cl.² B28C *5/00*; B01F *7/18*
U.S. Cl. 366—65 **18 Claims**



1. A portable mixer for mixing mortar and the like comprising

a housing having side walls and a top wall and open at the bottom thereof, with the margin of the opening substantially defining a plane so that the housing may rest stably on a generally flat surface,

a mixer blade disposed to move within the housing generally in the plane defined by the opening in the housing to thereby mix and agitate material positioned on a support surface on which the housing is placed,

motor or engine means mounted on the housing,

means responsive to the operation of the motor or engine means for driving said mixer blade to move within the housing, and

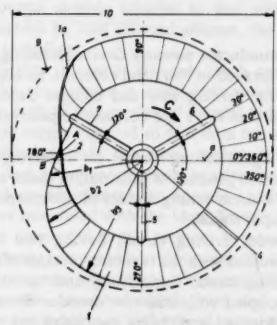
variable speed control means for causing the motor or engine means to operate at variable speeds to thereby cause said driving means to move the blade at variable speeds.

4,104,738

MIXING TOOL

Stefan Schulz, Vellmar, Fed. Rep. of Germany, assignor to Thyssen Industrie Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Jul. 28, 1976, Ser. No. 709,305
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1975, 2534418
Int. Cl.² B01F *7/26, 7/32*
U.S. Cl. 366—343 **1 Claim**



1. A rotatable mixing tool for installation in a mixing container, which includes: a rotatable shaft, having an axis of rotation, a member surrounding said shaft in radially spaced relationship thereto and being connected to said shaft for rotation therewith, said member having a first disc-shaped section coaxial with the axis of rotation of said shaft and having a top and a bottom surface located in planes perpendicular to said axis of rotation of said rotatable shaft, said member also having a second section twisted relative to said first section so as to merge said top surface of said first section with the bottom surface of the latter.

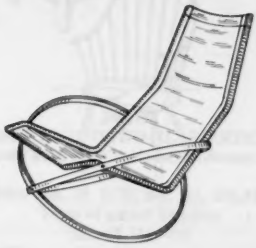
DESIGNS

AUGUST 1, 1978

248,696
TOOTH BRUSH
Sylvan Greenberg, 111 E. 85th St., New York, N.Y. 10028
Filed Sep. 2, 1976, Ser. No. 719,725
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25

248,697
STOOL OR SIMILAR ARTICLE
James E. Miller, 12900 W. Ten Mile Rd., South Lyon, Mich. 48178
Division of Ser. No. 698,167, Jun. 21, 1976. This application Oct. 17, 1977, Ser. No. 842,496
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—32

248,698
ROCKING CHAIR
Roger Louis Lecal, 74, rue de Meaux, 75019 Paris, France
Filed Apr. 26, 1976, Ser. No. 680,150
Claims priority, application France, Oct. 24, 1975, 75 28493
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—49

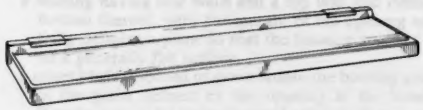


248,699
SOFA
Rodney R. Haynes, Sr., Richmond, Va., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Sep. 7, 1976, Ser. No. 720,544
The portion of the term of this patent subsequent to May 3, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

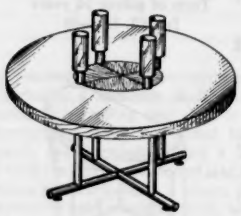
248,700
CHAIR
Thomas F. Moser, Cobb's Bridge Rd., New Gloucester, Me. 04260
Filed Jan. 13, 1977, Ser. No. 759,087
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—70

248,701
SOFA
Rodney R. Haynes, Sr., Richmond, Va., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Sep. 7, 1976, Ser. No. 720,548
The portion of the term of this patent subsequent to May 3, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

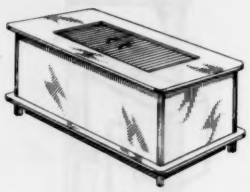
248,702
BATHROOM SHELF
Giovanni Baldini, Turin, Italy, assignor to Carrara & Matta S.p.A., Turin, Italy
Filed Aug. 17, 1976, Ser. No. 715,081
Claims priority, application Italy, Feb. 24, 1976, 52982/76
Term of patent 14 years
Int. Cl. D6—*04;* D23—*02*
U.S. Cl. D6—132



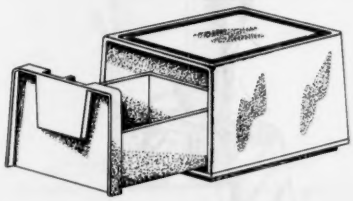
248,703
COMBINED AND MULTIPLE CANDLEHOLDER UNIT
Alexander P. Morgan, Jr., Constitution Hill, Princeton, N.J. 08540
Filed Mar. 29, 1976, Ser. No. 671,208
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—146



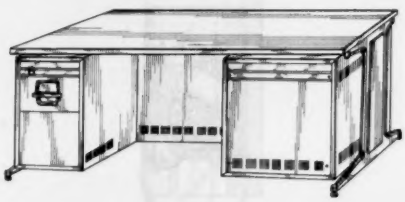
248,704
STORAGE CABINET
Nadine F. Gayda, 1734 Kaiser, Irvine, Calif. 92714
Filed Oct. 7, 1976, Ser. No. 730,451
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—150



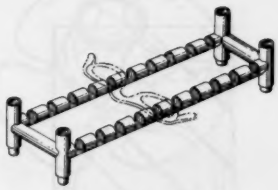
248,705
FILE CABINET
Fred L. Thomas, 1541 Siskiyou Dr., Walnut Creek, Calif. 94598
Filed Sep. 30, 1975, Ser. No. 618,151
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—158



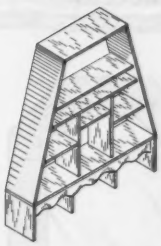
248,706
DESK OR SIMILAR ARTICLE
David Rolfe Smith, Hillsboro, and Richard Ellwood Hansen, Portland, both of Oreg., assignors to Tektronix, Inc.
Filed Apr. 5, 1976, Ser. No. 673,780
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161



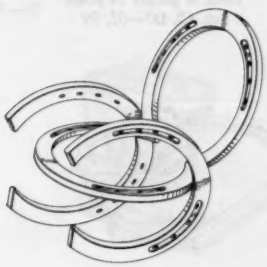
248,707
EYEGLASS HOLDER
Marcia M. Gitlitz, P.O. Box 1084, Fort Lee, N.J. 07204
Filed Jun. 28, 1976, Ser. No. 700,604
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—188



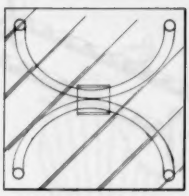
248,708
SHELF UNIT OR SIMILAR ARTICLE
Sheldon Howard Graff, 707 Continental, Mountain View, Calif. 94040
Filed Feb. 25, 1976, Ser. No. 656,312
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—190



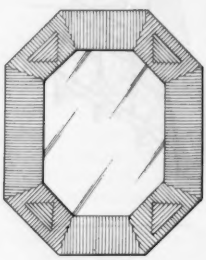
248,709
HORSE SHOES SHAPED SUPPORT FRAME FOR ROCKING CHAIR
Emil Vee Lundgren, 1715 W. Westward, Banning, Calif. 92220
Filed Aug. 2, 1976, Ser. No. 710,803
Term of patent 3½ years
Int. Cl. D6—*06*
U.S. Cl. D6—191



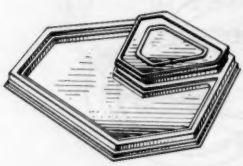
248,710
PICTURE FRAME
Edward S. Korzon, Beacon Falls, Conn., assignor to Dura Plastics of New York, Inc., Westport, Conn.
Filed Dec. 22, 1976, Ser. No. 753,196
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—235



248,711
MIRROR FRAME
David Tougas, Santa Monica; Peter Adler, and Mark Liszt, both of Los Angeles, all of Calif., assignors to Lucid Lines, Inc.
Filed Feb. 8, 1977, Ser. No. 766,808
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—241



248,712
COMBINED SERVING TRAY AND COVERED DISH
Raul Guibert, 8343 W. 4th St., Los Angeles, Calif. 90048
Filed Oct. 20, 1976, Ser. No. 734,050
Term of patent 14 years
Int. Cl. D7—*01, 99*
U.S. Cl. D7—3

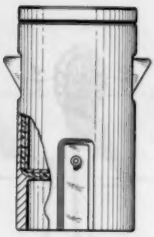


248,713
COMBINED BEVERAGE GLASSES AND HOLDER THEREFOR
Robert L. Dedrick, 4025 W. Lee St., Skokie, Ill. 60076
Filed Oct. 26, 1976, Ser. No. 735,815
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—3

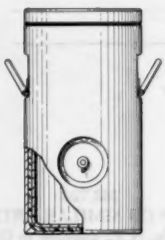
248,714
COMBINED BEVERAGE GLASSES AND HOLDER THEREFOR
Robert L. Dedrick, 4025 W. Lee St., Skokie, Ill. 60076
Filed Nov. 29, 1976, Ser. No. 745,612
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—3

248,715
TUMBLER OR SIMILAR ARTICLE
Peter A. Gobleck, Jr., Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Feb. 20, 1976, Ser. No. 659,966
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—6

248,716
BEVERAGE CONTAINER
Thomas E. Little, 2610 Nicholson, Houston, Tex. 77008
Continuation-in-part of Ser. No. 567,778, Apr. 14, 1975, Pat. No. Des. 242,834. This application Aug. 6, 1976, Ser. No. 712,406
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—61

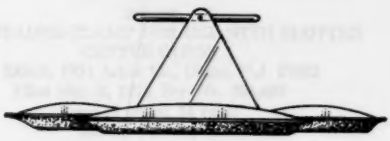


248,717
BEVERAGE CONTAINER
Thomas E. Little, 2610 Nicholson, Houston, Tex. 77008
Continuation-in-part of Ser. No. 567,778, Apr. 14, 1975, Pat. No. Des. 242,834. This application Aug. 6, 1976, Ser. No. 712,407
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—61



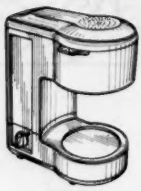
248,718
BEVERAGE CONTAINER
Thomas E. Little, 2610 Nicholson, Houston, Téx. 77008
Continuation-in-part of Ser. No. 567,778, Apr. 14, 1975, Pat. No. Des. 242,834. This application Aug. 6, 1976, Ser. No. 712,408
Term of patent 14 years
Int. Cl. D7—*61, 04*
U.S. Cl. D7—61

248,719
GIMBALLED BEVERAGE CUP HOLDER
Jerry C. Broyles, 8571 18th St., Alta Loma, Calif. 91701
Filed Apr. 14, 1976, Ser. No. 676,692
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—70

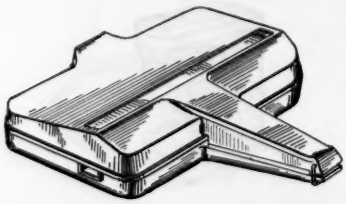


248,720
COFFEE MAKER
Teizo Sato; Masaru Miyazaki, and Takuji Kaneko, all of Suita, Japan, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 2, 1976, Ser. No. 673,260
Claims priority, application Japan, Oct. 6, 1975, 5040276
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—85

248,721
COFFEE MAKER
Teizo Sato; Masaru Miyazaki, and Takuji Kaneko, all of Suita, Japan, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 2, 1976, Ser. No. 673,268
Claims priority, application Japan, Oct. 6, 1975, 50-40277
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—85

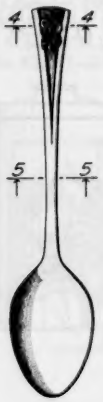


248,722
HAMBURGER COOKER
Masao Tsuji, North Plainfield, N.J., assignor to North American Philips Corporation, New York, N.Y.
Filed Apr. 26, 1976, Ser. No. 680,079
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—88

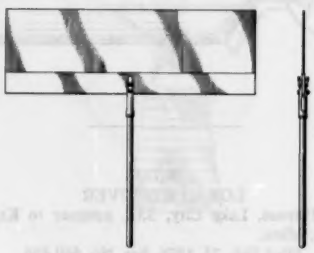


248,723
SPOON OR SIMILAR ARTICLE
Ellen B. Manderfield, Syracuse, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Dec. 10, 1976, Ser. No. 749,706
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

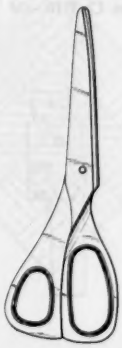
248,724
SPOON OR SIMILAR ARTICLE
Melvin A. Lea, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Dec. 10, 1976, Ser. No. 751,049
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137



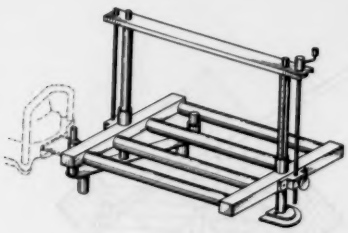
248,725
PAINT SHIELD
Robert A. McClane, Anaheim, Calif., assignor to Impact Manufacturing Co., Inc., Santa Fe Springs, Calif.
Filed Nov. 22, 1976, Ser. No. 743,728
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14



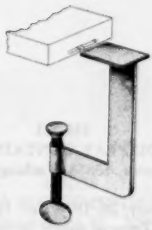
248,726
SCISSORS
Hidekazu Okada, No. 17-29, Asahigaoka-cho, Ashiya-shi, Japan
Filed Jun. 10, 1976, Ser. No. 694,696
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—57



248,727
SAWMILL ATTACHMENT FOR A CHAIN SAW
Robert Sperber, 217 Smull Ave., North Caldwell, N.J. 07006
Filed Sep. 13, 1976, Ser. No. 722,619
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—71

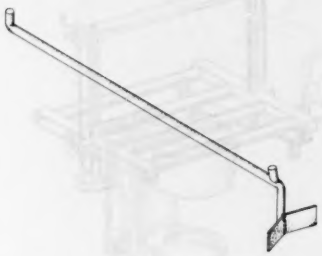


248,728
FLAT-HEADED CLAMP FOR USE WITH SLOTTED CUTTER GUIDE
Clayton A. Elliott, 1931 Arbor La., Union, N.J. 07083
Filed Mar. 8, 1976, Ser. No. 664,499
Term of patent 14 years
Int. Cl. D8—*05, 08*
U.S. Cl. D8—72

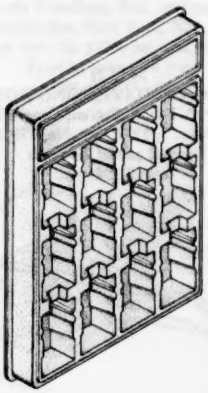


248,729
DIAMOND SHARPENING HONE
Fred G. Gunzner, P.O. Box 8, Colton, Oreg. 97017
Filed Mar. 7, 1977, Ser. No. 775,251
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—91

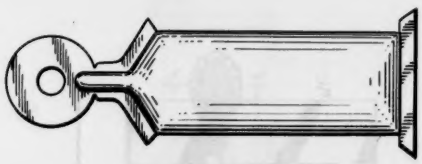
248,730
CONTAINER BRACKET OR THE LIKE
Ellis L. Blann, 213 Oak Leaf Dr., Wilmington, N.C. 28401
Filed Oct. 1, 1976, Ser. No. 728,532
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—363



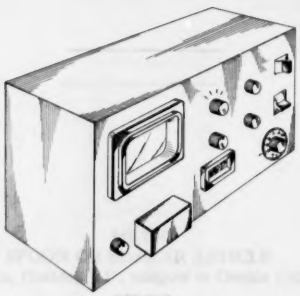
248,731
DISPLAY CONTAINER
Katsuyoshi Ken Ogawa, 10838 Washington Blvd., Culver City, Calif. 90230
Filed Nov. 26, 1976, Ser. No. 745,310
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—187



248,732
COLLAPSIBLE TUBELIKE CONTAINER
Neithard Vollmar, Schillerstr. 46, 4000 Dusseldorf 1, Germany
Filed Jul. 1, 1976, Ser. No. 701,927
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—194



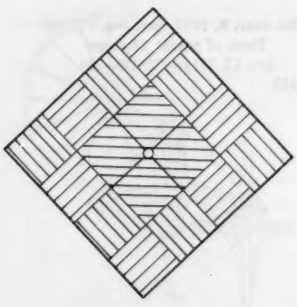
248,733
LORAN RECEIVER
James R. Haynes, Lake City, S.C., assignor to Kayot, Inc., Mankato, Minn.
Filed Feb. 23, 1976, Ser. No. 660,456
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46



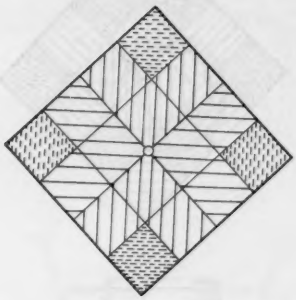
248,734
CABLE SHEATH CONTINUITY TESTER
Robert Husserl, Northridge, Calif., assignor to Perkins Research and Manufacturing Co., Canoga Park, Calif.
Filed Sep. 2, 1976, Ser. No. 719,922
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—78

248,735
COMBINED LIGHTHOUSE AND WIND DIRECTION INDICATOR
Joseph O. Tally, Jr., 560 N. St., SW., Washington, D.C. 20024
Filed Nov. 17, 1976, Ser. No. 742,445
Term of patent 14 years
Int. Cl. D10—*06, 04*
U.S. Cl. D10—114

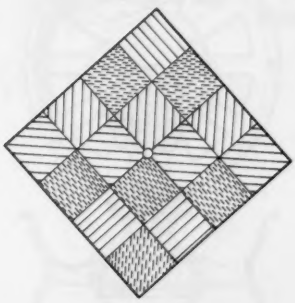
248,736
DIAL FOR TIMEPIECES
Edwin A. Day, 607 Quackenbos St., NW., Washington, D.C. 20011
Filed Apr. 2, 1976, Ser. No. 672,873
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—125



248,737
DIAL FOR TIMEPIECES
Edwin A. Day, 607 Quackenbos St., NW., Washington, D.C. 20011
Filed Apr. 2, 1976, Ser. No. 672,858
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—125



248,738
DIAL FOR TIMEPIECES
Edwin A. Day, 607 Quackenbos St., NW., Washington, D.C. 20011
Filed Apr. 2, 1976, Ser. No. 672,856
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—125



248,739
DIAL FOR TIMEPIECES
Edwin A. Day, 607 Quackenbos St., NW., Washington, D.C. 20011
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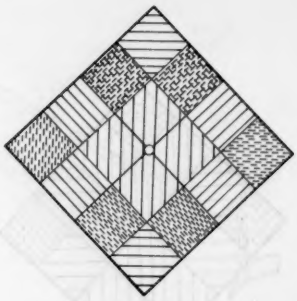
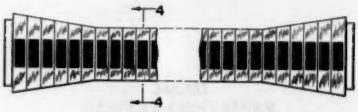
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—125



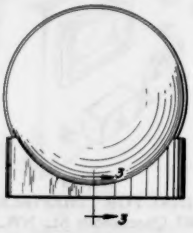
248,740
WATCHBAND
Robert I. Harris, Providence, R.I., assignor to Brite Industries, Inc., Providence, R.I.
Filed Apr. 5, 1976, Ser. No. 673,978
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—25



248,741
DIAMOND RING
Josef J. Barr, 293 S. County Rd., Palm Beach, Fla. 33480
Filed Mar. 30, 1976, Ser. No. 672,485
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—33

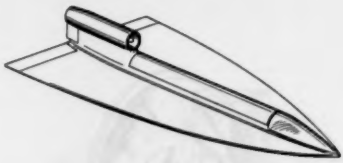
248,742
CHRISTMAS ORNAMENT
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 7, 1976, Ser. No. 674,531
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—129

248,743
STANDING PLAQUE
William B. Campbell, Saint Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Division of Ser. No. 788,650, Apr. 18, 1977. This application Oct. 11, 1977, Ser. No. 840,723
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—140

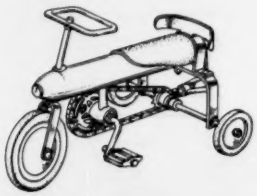


248,744
PLANTER
Dennis A. Murray, Briarcliff Manor, N.Y., assignor to Pyramid Planter, Inc.
Filed Mar. 9, 1977, Ser. No. 776,009
Term of patent 14 years
Int. Cl. D11—*02*; D6—*06*
U.S. Cl. D11—143

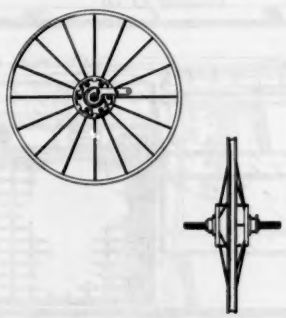
248,745
MODIFIED DELTA WING SUPERSONIC AIRCRAFT
Frank W. Jager, 7050 Tait St., San Diego, Calif. 92111
Filed Jun. 1, 1976, Ser. No. 691,851
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—71



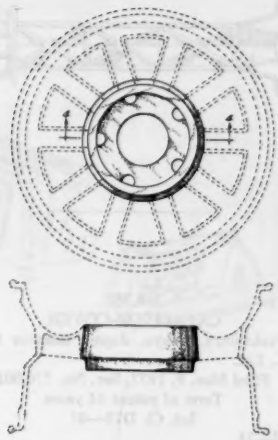
248,746
TRICYCLE
Phillipp Gonzalez, 2730 W. 15th St., Los Angeles, Calif. 90006
Filed Jul. 5, 1977, Ser. No. 812,586
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—112



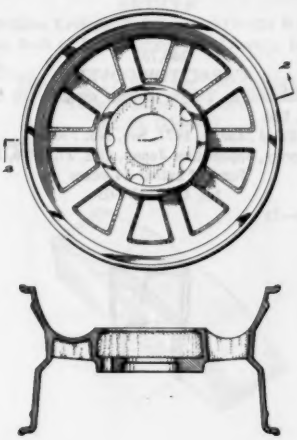
248,747
COMBINED BICYCLE BRAKE AND WHEEL ASSEMBLY
Edwin Elliott Hood, South Bend, Ind., assignor to Bendix Corporation, Southfield, Mich.
Continuation-in-part of Ser. No. 712,997, Aug. 9, 1976, abandoned. This application Aug. 12, 1977, Ser. No. 823,898
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205



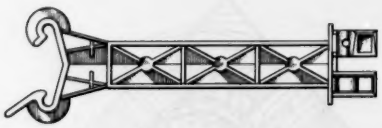
248,748
WHEEL CENTER
John Siroonian, Fresno, Calif., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Filed Apr. 28, 1977, Ser. No. 792,026
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—207



248,749
WHEEL
John Siroonian, Fresno, Calif., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Filed Nov. 26, 1976, Ser. No. 745,439
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



248,750
ELECTRIC FENCE EXTENDER FOR T-POSTS
Howard Langlie, and Albert T. Berg, Jr., both of Ellendale, Minn. 56026
Filed Apr. 25, 1977, Ser. No. 790,748
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—17

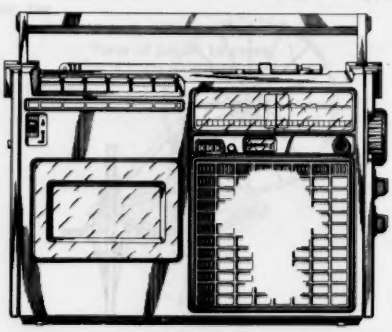


248,751
CAPACITOR-COVER
Toshinobu Nakamura, Tokyo, Japan, assignor to Shinagawa Shoko Co., Ltd.
Filed Mar. 9, 1977, Ser. No. 776,001
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—21

248,752
CAPACITOR-COVER
Toshinobu Nakamura, Tokyo, Japan, assignor to Shinagawa Shoko Co., Ltd.
Filed Mar. 9, 1977, Ser. No. 776,002
Claims priority, application Japan, Oct. 27, 1976, 51-42465
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—21

248,753
RECORD
Carl Frederick Pulse, Greenwood, Ind., assignor to RCA Corporation, New York, N.Y.
Filed Jul. 18, 1975, Ser. No. 597,219
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—1

248,754
COMBINED CASSETTE TAPE RECORDER AND RADIO
Richard Culbertson, Manlius, N.Y., assignor to General Electric Company
Filed Jun. 11, 1976, Ser. No. 695,173
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—5



248,755

TAPE CASSETTE CASE

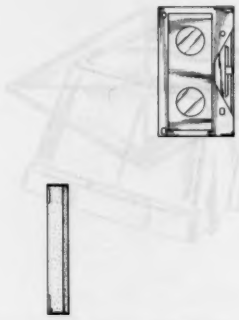
Daizi Nagatomo, Yokohama, Japan, assignor to Sony Corporation

Filed Mar. 8, 1976, Ser. No. 662,950

Term of patent 14 years

Int. Cl. D14—*99*

U.S. Cl. D14—11



248,756

LOUDSPEAKER HOUSING

Alfonsus Bernardus Antonius Labohm, Maarheeze, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

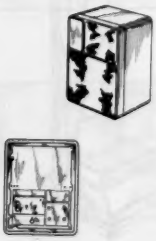
Filed Feb. 24, 1976, Ser. No. 660,999

Claims priority, application Benelux, Aug. 25, 1975, 50511-04

Term of patent 14 years

Int. Cl. D14—*01*

U.S. Cl. D14—33



248,757

PORTABLE COMBINATION LOUDSPEAKER AND RADIO MOUNT

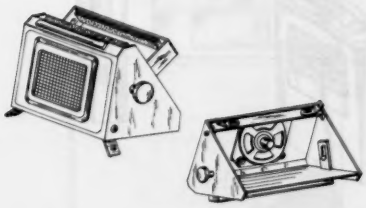
David J. Bokmiller, Lakewood, Ohio, assignor to Falcon Enterprises, Inc.

Filed Jun. 29, 1976, Ser. No. 700,753

Term of patent 14 years

Int. Cl. D14—*99;* D12—*16;* D8—*08*

U.S. Cl. D14—37



248,758

VEHICULAR TELEPHONE APPARATUS OR SIMILAR ARTICLE

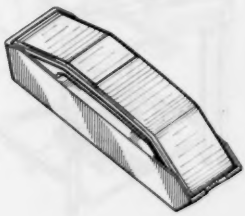
Rudolph William Krolopp, Palatine, and Orville Walter Larson, Elmhurst, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 12, 1976, Ser. No. 713,762

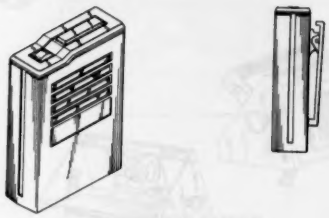
Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—53

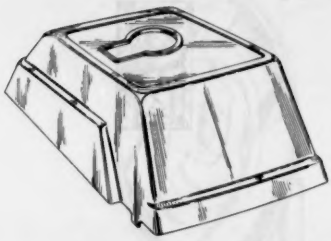


248,759
RADIO PAGER OR SIMILAR ARTICLE
John Allie Eckmann, Pompano Beach, and Richard John Toth, Oakland Park, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 29, 1977, Ser. No. 811,226
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68

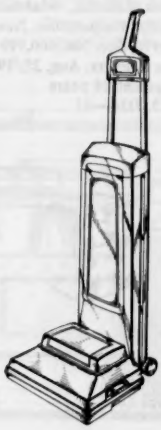


248,760
COMBINED SOUND REDUCING COVER FOR TELEPRINTER OR THE LIKE AND SUPPORT MEMBER THEREFOR
Berndt Ebbe Frick, Herrgårdsvägen 9, 135 00 Tyresö, Sweden
Division of Ser. No. 544,767, Jan. 28, 1975, Pat. No. Des. 245,628. This application Aug. 2, 1976, Ser. No. 710,469
Claims priority, application Sweden, Aug. 5, 1974, 741241
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—93

248,761
ENGINE SHROUD FOR ROTARY LAWN MOWER
Charles E. Uhlinger, Des Moines, and Herbert Owen Dixon, Jr., Altoona, both of Iowa, assignors to AMF Incorporated, White Plains, N.Y.
Filed May 7, 1976, Ser. No. 684,389
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—17

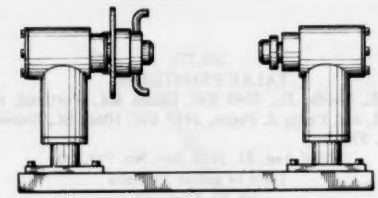


248,762
UPRIGHT VACUUM CLEANER
Fred R. Burgess, Wallingford, and George Schick, Easton, both of Conn., assignors to Consolidated Foods Corporation, Old Greenwich, Conn.
Filed Oct. 5, 1976, Ser. No. 729,625
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—53

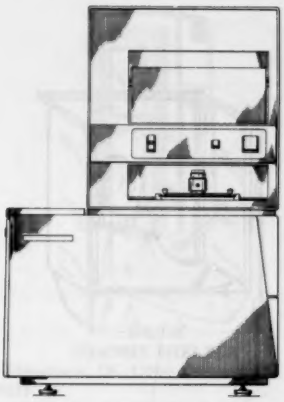


248,763
FLAT-PLATE NOZZLE FOR A VACUUM CLEANER
Albert F. Muller, 11724 Eton Dr., Colton, Calif. 92324
Filed Jan. 10, 1977, Ser. No. 758,179
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—63

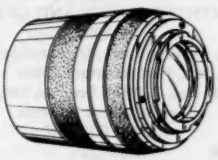
248,764
UNROLLING DEVICE FOR A CABLE
Per Olof Hedlund, Norsborg; Lars Olov Hertsius, Bromma, and Hans Theo Lessmann, Trangsund, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Feb. 25, 1976, Ser. No. 661,409
Claims priority, application Sweden, Sep. 4, 1975, 751708
Term of patent 7 years
Int. Cl. D15—*99*
U.S. Cl. D15—122



248,765
MICROFICHE COPIER
Robert A. Clowe, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Mar. 16, 1977, Ser. No. 778,306
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—29

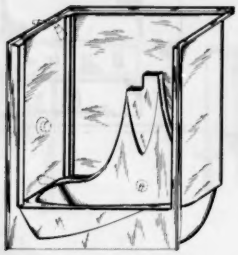


248,766
BARREL FOR INTERCHANGEABLE LENS
Takeyuki Arai, Omiya, Japan, assignor to Kabushiki Kaisha Tamron, Omiya, Japan
Filed May 20, 1976, Ser. No. 688,339
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—50



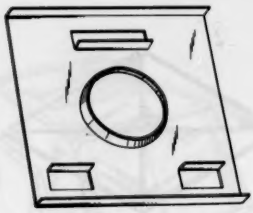
248,767
FISHING REEL CLAMP
Carl W. Newell, 940 Allen Ave., Glendale, Calif. 91201
Filed Mar. 24, 1976, Ser. No. 670,085
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—23

248,768
COMBINED BATHTUB AND SHOWER STALL
Erwin G. Rehbein, P.O. Box 80A, Waupaca, Wis. 54981
Filed Dec. 23, 1976, Ser. No. 753,635
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49

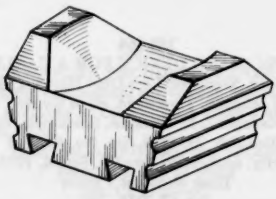


248,769
COMBINED BATHTUB WASTE AND OVERFLOW FACE PLATE
George G. Jetter, Fort Recovery, Ohio, assignor to Fort Recovery Industries, Inc., Fort Recovery, Ohio
Filed Dec. 2, 1976, Ser. No. 746,992
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69

248,770
CONVECTOR PLATE
Niels Runar Hilding Michaelsen, Bot 12031, 63012 Eskilstuna, Sweden
Filed Mar. 25, 1976, Ser. No. 670,390
Claims priority, application Sweden, Sep. 30, 1975, 751945
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127



248,771
TIBIAL PROSTHESIS
Harry E. Groth, Jr., 3840 SW. Dosch Rd., Portland, Oreg. 97201, and Philip J. Fagan, 3480 SW. 106th St., Beaverton, Oreg. 97005
Filed Aug. 31, 1976, Ser. No. 719,229
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—33

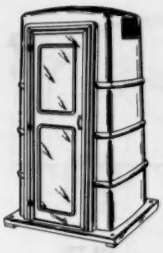


248,772
TALAR PROSTHESIS
Harry E. Groth, Jr., 3840 SW. Dosch Rd., Portland, Oreg. 97201, and Philip J. Fagan, 3480 SW. 106th St., Beaverton, Oreg. 97005
Filed Aug. 31, 1976, Ser. No. 719,230
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—33

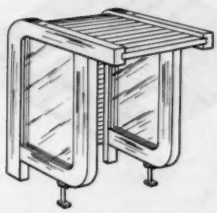
248,773
ORBITAL VIBRATORY MASSAGER
E. Lowell Schaefer, 6347 Deerfield Ave., San Gabriel, Calif. 91775
Filed Jan. 27, 1977, Ser. No. 763,068
Term of patent 14 years
Int. Cl. D28—*03;* D24—*99*
U.S. Cl. D24—36

248,774
SURGICAL ASPIRATION CATHETER
Bertil Sven Vällfors, Goteborg, Sweden, assignor to Astra -Sjuco AB
Filed Apr. 28, 1976, Ser. No. 681,242
Claims priority, application Sweden, Oct. 30, 1975, 752144
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—54

248,775
PORTABLE SANITATION UNIT
Clarence Samuel Brown, Los Angeles County, Calif., assignor to Usanco, Inc., El Monte, Calif.
Filed Dec. 17, 1976, Ser. No. 751,904
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—16



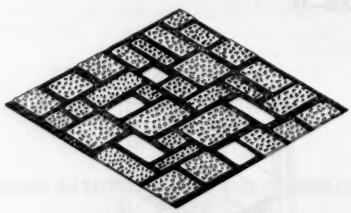
248,776
TRANSIT SHELTER
Joseph E. Kinnebrew, IV, 13300 Beckwith Dr. NE., Lowell, Mich. 49331
Filed Nov. 8, 1976, Ser. No. 739,569
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—18



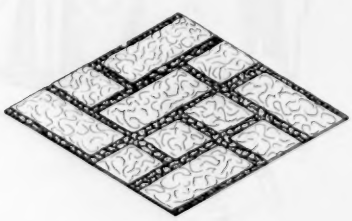
248,777
LADDER PLATFORM
Edward Spencer, La Grange, Ill., and Harold R. Wing, Springville, Utah, assignors to Little Giant Industries, Inc., American Fork, Utah
Filed Jun. 1, 1976, Ser. No. 691,644
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D25—68

248,778
SWIMMING POOL COPYING OR THE LIKE
Herbert O. Kaufmann, Kew Gardens, N.Y., assignor to Swim 'N Play, Inc., Newark, N.J.
Filed May 25, 1976, Ser. No. 689,863
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—74

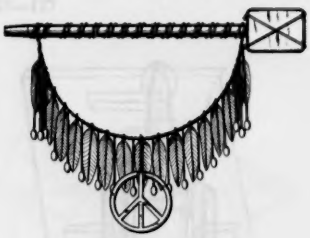
248,779
DECORATIVE TILE
Eugene J. Demetrovics, Whitehall, Pa., assignor to GAF Corporation, New York, N.Y.
Filed Nov. 16, 1976, Ser. No. 742,273
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—86



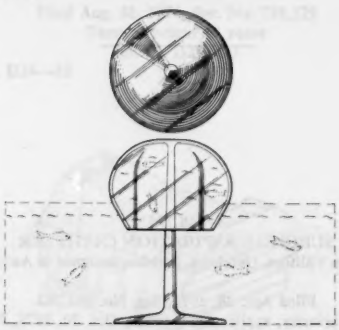
248,780
DECORATIVE TILE
James W. Sears, Jr., Newburgh, N.Y., assignor to GAF Corporation, New York, N.Y.
Filed Nov. 16, 1976, Ser. No. 742,274
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—86



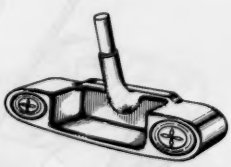
248,781
PEACE PIPE
Gary Mead, Blairhill Rd., Fleischmann Village, N.Y. 12430
Filed Jan. 26, 1977, Ser. No. 762,501
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—04



248,782
AQUARIUM ATTACHMENT
Thomas G. Randall, Jr., Rte. 2, Box 71e, Williston, Vt. 05495
Filed Jul. 20, 1977, Ser. No. 817,193
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—12

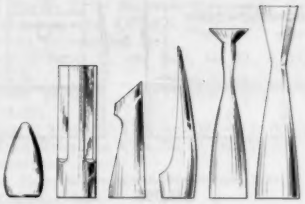


248,783
GOLF PUTTERHEAD
Steven Kenneth Long, 17151 Almaden Rd., San Jose, Calif. 95120
Filed Nov. 28, 1975, Ser. No. 636,115
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



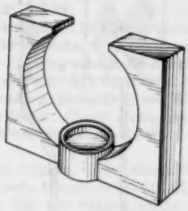
248,784
CONCRETE BASKETBALL STANDARD
James E. Miller, 12900 W. Ten Miles Rd., South Lyon, Mich. 48178
Filed Jun. 21, 1976, Ser. No. 698,209
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 VV

248,785
SET OF CHESS GAME PIECES
Terry M. Haber, 3050 S. Bristol #8C, Santa Ana, Calif. 92707
Filed Jan. 27, 1977, Ser. No. 763,067
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 CH



248,786
COMBINED NESTABLE BATH TOY
Shinroku Nakao, Yokohama, Japan, assignor to Combi Co., Ltd., Tokyo, Japan
Filed Feb. 20, 1976, Ser. No. 659,827
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 V

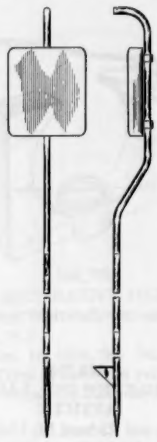
248,787
BASE FOR CANDLE HOLDER, LAMP OR SIMILAR ARTICLE
Raymond M. Ulrich, and Richard M. Ulrich, both of Washington, Ill., assignors to Ulrich Foundation, Inc., Washington, Ill.
Filed Mar. 9, 1977, Ser. No. 775,697
Term of patent 14 years
Int. Cl. D26—*01, 05*
U.S. Cl. D48—2



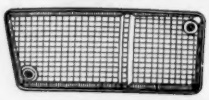
248,788
BASE FOR CANDLE HOLDER, LAMP OR SIMILAR ARTICLE
Raymond M. Ulrich, and Richard M. Ulrich, both of Washington, Ill., assignors to Ulrich Foundation, Inc., Washington, Ill.
Filed Mar. 9, 1977, Ser. No. 775,700
Term of patent 14 years
Int. Cl. D26—*01, 05*
U.S. Cl. D48—2

248,789
BASE FOR CANDLE HOLDER, LAMP OR SIMILAR ARTICLE
Raymond M. Ulrich, and Richard M. Ulrich, both of Washington, Ill., assignors to Ulrich Foundation, Inc., Washington, Ill.
Filed Mar. 9, 1977, Ser. No. 775,702
Term of patent 14 years
Int. Cl. D26—*01, 05*
U.S. Cl. D48—2

248,790
LANTERN HOLDER OR SIMILAR ARTICLE
Frank L. Castor, Cheney, Kans. 67025
Filed Jun. 30, 1976, Ser. No. 701,118
Term of patent 7 years
Int. Cl. D26—*05*
U.S. Cl. D48—4 A

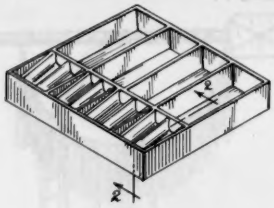


248,791
LENS FOR VEHICLE SIGNAL LIGHT
Michel Tixier, Boulogne-Billancourt, France, assignor to Regie Nationale Des Usines Renault, Boulogne-Billancourt, France
Filed Dec. 23, 1975, Ser. No. 643,673
Claims priority, application France, Jul. 1, 1975, 75 73991
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 A

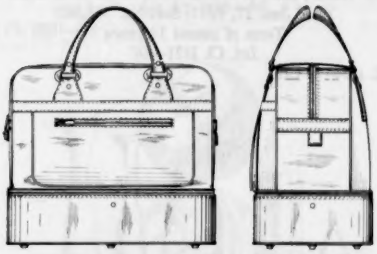


248,792
AUTOMOBILE HEADLIGHT LENS
Pierre Cibie, Paris, France, assignor to Cibie Projecteurs, Paris, France
Filed Aug. 18, 1977, Ser. No. 825,809
Claims priority, application France, May 26, 1977, 77 40288
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 A

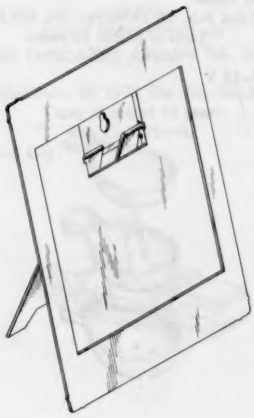
248,793
COIN SECTIONS FOR USE WITH A CASH DRAWER
Tom H. Ross, 2761 Georgian Ter., Marietta, Ga. 30062
Filed Jul. 6, 1976, Ser. No. 703,060
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D52—4 R



248,794
TRAVEL BAG
Marvin Cooper, New Rochelle, N.Y., assignor to Dynamic Classics, Ltd., New York, N.Y.
Filed Aug. 6, 1976, Ser. No. 712,276
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5 G



248,795
DISPLAY STAND
Anthony Restaino, Plainview, N.Y., assignor to Revlon, Inc.
Filed Dec. 17, 1976, Ser. No. 751,380
Term of patent 14 years
Int. Cl. D20—*03;* D6—*07*
U.S. Cl. D96—12 A



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TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF AUGUST, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A B Motala Verkstad: *See—*
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A. F. Hydraulics Limited: *See—*
Reynolds, Lionel Arthur, 4,103,746, Cl. 173-107.000.

A-Lok Corporation: *See—*
Ditcher, John, 4,103,901, Cl. 277-9.500.

AB Akerlund & Rausing: *See—*
Piltz, Lars-Eric; and Jeppsson, Jan-Bertil, 4,103,802, Cl. 220-258.000.

Abbott, Bernard J.: *See—*
Fukuda, David S.; Abbott, Bernard J.; and Archer, Robert A., 4,104,282, Cl. 260-345.300.

Abbott Laboratories: *See—*
Bernstein, Edith; Chu, Daniel Tim-Wo; and Huckin, Stuart Nicholas, 4,104,306, Cl. 260-571.000.

Abdou-Sabet, Sabet; and Ferrin, J. Paul, to Monsanto Company. Acrylate-modified ethylene-vinyl acetate polymer. 4,104,329, Cl. 260-878.00R.

Abe, Hiroshi: *See—*
Tomita, Chuji; and Abe, Hiroshi, 4,104,527, Cl. 250-445.00T.

Abe, Michio, to Kinoshita Seiki Kabushiki Kaisha. Conical spring washer. 4,103,725, Cl. 151-35.000.

Abex Corporation: *See—*
Ridenour, Charles E.; Fabert, Herman A., Jr.; Tasker, John; and Larson, Hugo R., 4,104,504, Cl. 219-73.100.

Abrams, Richard L., to Hughes Aircraft Company. Laser internal coupling modulation arrangement with wire grid polarizer serving as a reflector and coupler. 4,104,598, Cl. 331-94.50M.

Abrams, Stanton: *See—*
Dieterich, Frank L.; and Abrams, Stanton, 4,103,432, Cl. 34-58.000.

Abramson, Harvey J., to Metatech Corporation. Shoe cover and method of making same. 4,103,439, Cl. 36-7.300.

ACF Industries, Incorporated: *See—*
Hammonds, James C.; and Holt, Jan D., 4,103,624, Cl. 105-199.0CB.
Houlgrave, Robert C.; and Talafuse, Larry J., 4,103,863, Cl. 251-48.000.

Ackrell, Jack, to Syntex (U.S.A.) Inc. Dibenzo [b.f]thiepin and dibenzo[b.f]oxepin derivatives. 4,104,280, Cl. 260-327.00B.

Acme Electric Corp.: *See—*
Lawson, Harry W., Jr., 4,104,715, Cl. 363-37.000.

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Porter, Raymond P., 4,103,385, Cl. 15-250.360.

Adalbert, Gerhard; Hess, Jurgen; and Hecht, Ulrich, to Robert Bosch GmbH. Method and arrangement for controlling the operation of a cooling system in an automotive vehicle. 4,103,506, Cl. 62-61.000.

Adams, Phillip: *See—*
Weiss, Marvin; Adams, Phillip; Nass, Gerald I.; and Leitner, Roland L., 4,104,144, Cl. 204-159.230.

Adler, Arnold Henry, to Burroughs Corporation. Accounts receivable system. 4,103,935, Cl. 283-66.00R.

Adolph Coors Company: *See—*
Andrews, Richard E.; Hooker, Ira D.; and Simons, Daniel R., 4,103,789, Cl. 214-41.00R.
Totten, Roger W., 4,104,081, Cl. 134-23.000.

Aerojet-General Corporation: *See—*
Lista, Edwin L.; and Williams, Kenneth S., 4,103,584, Cl. 86-1.00R.

Aetna-Standard Engineering Company: *See—*
Schuetz, James W., 4,103,530, Cl. 72-312.000.

AGFA-Gevaert, AG: *See—*
Fergg, Berthold; Knapp, Walter; and Zahn, Wolfgang, 4,103,996, Cl. 355-32.000.
Krafft, Werner; Arnold, Gunther; Paal, Gabor; and Vollmer, Hans-Peter, 4,104,067, Cl. 96-1.50R.
Laar, Erwin, 4,104,668, Cl. 354-299.000.
Vanheerentals, Jacques Leon; Pfeifer, Josef; Klocke, Helmut; and Paulus, Rudolf, 4,104,069, Cl. 96-23.000.
Winkler, Alfred; Lermann, Peter; Engelsmann, Dieter; and Fauth, Gunter, 4,104,664, Cl. 354-213.000.
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Smolderen, Albert Emiel, 4,103,775, Cl. 206-455.000.

Ahlburn, Byron T.: *See—*
Kendall, Don L.; Ahlburn, Byron T.; and Wiemer, Klaus C., 4,104,697, Cl. 361-305.000.

Aichelmann, Frederick John, Jr.; Di Pilato, Nino Mario; Fehn, Thomas Peter; and Rudy, George John, to International Business Machines Corporation. Parity checking scheme for detecting word line failure in multiple byte arrays. 4,103,823, Cl. 235-312.000.

Aichinger, Horst; Kranberg, Heinz-Erik; and Koehler, Karlheinz, to Siemens Aktiengesellschaft. Circuit arrangement for a detector for ionizing radiation. 4,104,524, Cl. 250-402.000.

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Aimono, Yuji; Omori, Eiji; and Nakano, Mineo, to Hitachi Chemical Company, Ltd. Odorless or low-odor resinous composition. 4,104,215, Cl. 260-22.0CB.

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Dixon, Dale D.; Ford, Michael E.; and Mantell, Gerald J., 4,104,264, Cl. 528-370.000.
Sims, Victor A., 4,104,220, Cl. 260-29.60R.
Stone, Francis Gordon Albert; Green, Michael; Scholes, Gary; and Spencer, John Lionel, 4,104,471, Cl. 544-178.000.

Airco, Inc.: *See—*
Benois, Hugues G., 4,103,507, Cl. 62-63.000.
Terrell, Ross C., 4,104,314, Cl. 260-614.00F.

Aizenkaid, Mark Moiseevich: *See—*
Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.

Ajami, Alfred M.: *See—*
Walsh, Fraser M.; Crouse, Dennis N.; and Ajami, Alfred M., 4,104,447, Cl. 429-15.000.

Akeda, Kouichi: *See—*
Nishida, Tsuyoshi; Tabushe, Satoshi; and Akeda, Kouichi, 4,103,650, Cl. 123-41.860.

Akimoto, Yumi; Ishii, Tamotsu; Yoshizumi, Motohiko; and Haghino, Sadaaki, to Mitsubishi Kinzoku Kabushiki Kaisha. Magnetite ferrite for magnetostrictive vibrators. 4,104,549, Cl. 310-26.000.

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Ullmann, Werner; and Panschow, Rudolf, 4,104,502, Cl. 219-69.00W.

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Buter, Roelof, 4,104,240, Cl. 260-39.00P.

Akzona Incorporated: *See—*
del Rio, Marija; Behnke, Joachim; Wallrabenstein, Michael; and Frank, Dieter, 4,104,258, Cl. 528-334.000.
Greven, Hendrik Marie; and de Wied, David, 4,104,371, Cl. 424-177.000.
Meierhoefer, Alan W., 4,104,214, Cl. 260-17.4CL.
Vukoje, Tatjana, 4,103,481, Cl. 57-140.00J.

Albert, Richard D. Grid-cathode controlled X-ray tube. 4,104,526, Cl. 250-403.000.

Albright, James A.: *See—*
Smith, Ray E.; and Albright, James A., 4,104,172, Cl. 252-8.100.

Ald, Inc.: *See—*
Jarvis, John R.; and Brown, Eldon W., 4,103,520, Cl. 68-12.00R.

Aldakushin, Stanislav Andreevich: *See—*
Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis,

Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.

Alden Research Foundation: *See—*
Williams, George C., 4,104,644, Cl. 346-139.00A.

Alfa-Laval AB: *See—*
Stroucken, Klaus H. D., 4,103,822, Cl. 233-20.00A.

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Garcea, Giampaolo, 4,104,337, Cl. 261-39.00A.

Alin, Jean-Marie Georges Fernand, to Gaz de France. Metallic non-premixed gas-burner with counter-rotation of gases. 4,104,017, Cl. 431-352.000.

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Peters, Victor; and Krammer, Franz, 4,104,219, Cl. 260-29.6RB.

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Grudowski, Raymond A.; and Struger, Odo J., 4,104,731, Cl. 364-900.000.

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Allenbach, Ronald L.: *See—*
Guthrie, Richard E.; and Allenbach, Ronald L., 4,103,557, Cl. 74-102.000.

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Allis-Chalmers Corporation: *See—*
Graef, Richard W., 4,103,878, Cl. 266-78.000.
Schaefer, Daniel W., 4,103,478, Cl. 56-205.000.
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Amax Inc.: *See—*
Davis, Phillip K.; Leaver, Helen S.; and Freiser, Henry, 4,104,359, Cl. 423-139.000.

Amchem Products, Inc.: *See—*
Anderson, James Douglas; Hayman, Edgar S., Jr.; and Rodzewich, Edward A., 4,104,303, Cl. 260-570.900.
Steinbrecher, Lester; and Hall, Wilbur S., 4,104,424, Cl. 427-435.000.

Amemiya, Akira: *See—*
Yoshikawa, Yoshio; Amemiya, Akira; Kimoto, Sigeru; and Kimpara, Hidenori, 4,104,192, Cl. 252-188.000.

American Air Filter Company, Inc.: *See—*
Brozenick, Nicholas J., 4,104,042, Cl. 55-101.000.
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American Clearwater Corp.: *See—*
Wolfe, Henry S., 4,103,379, Cl. 9-8.00R.

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Clem, Arthur G., 4,103,499, Cl. 61-50.000.

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Allen, Leigh Cameron, 4,104,335, Cl. 260-897.00A.

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Sarantakis, Dimitrios, 4,104,267, Cl. 260-112.50S.

American Medical Systems, Inc.: *See—*
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Tanaka, Akira; and Hollowell, William M., 4,103,967, Cl. 297-216.000.

AMP Incorporated: *See—*
Herrmann, Henry Otto, Jr.; and Glover, Douglas Wade, 4,104,521, Cl. 250-324.000.
Mixon, James Lenhart, Jr., 4,103,984, Cl. 339-98.000.

AMSTED Industries Incorporated: *See—*
Radwill, Robert P., 4,103,623, Cl. 105-197.0DB.

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Colato, Albert E.; and Formo, Jerome L., 4,103,736, Cl. 165-48.00R.

Anderka, Gerold, to Koh-I-Noor Rapidograph, Inc. Rupturable sealing element within an ink reservoir cartridge. 4,103,999, Cl. 401-134.000.

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Arndt, John J., 4,103,386, Cl. 15-250.420.

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Applegate, George D. J. Method of implanting synthetic hair. 4,103,365, Cl. 3-1.000.

Applied Fiberoptics, Inc.: *See—*
Kloots, Jacobus, 4,104,709, Cl. 362-105.000.

Applied Theory, Inc.: *See—*
Trulio, John G.; and Bless, Stephan J., 4,103,756, Cl. 181-121.000.

Arai, Kozo; Kotani, Teizo; and Mizushima, Toshio, to Japan Synthetic Rubber Company Limited. Method of and a device for measuring a relaxation phenomenon. 4,103,541, Cl. 73-88.00R.

Araki, Tsunehiko; and Okuda, Yoshihiko, to Matsushita Electric Works, Ltd. Light scattering type smoke detector. 4,103,997, Cl. 356-104.000.

ARBED, Acieries Reunies de Burbach-Eich-Dudelange S.A.: *See—*
Habert, Dietrich, 4,103,732, Cl. 164-147.000.

Arcair Company: *See—*
Rieppel, Perry J.; and Henderson, Harold Richard, 4,103,359, Cl. 2-8.000.

Archer, Robert A.: *See—*
Fukuda, David S.; Abbott, Bernard J.; and Archer, Robert A., 4,104,282, Cl. 260-345.300.

Argus Chemical Corporation: *See—*
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,104,217, Cl. 260-23.0XA.

Arimatsu, Tadayoshi. Apparatus for winding cut belt-like material. 4,103,839, Cl. 242-56.200.

Arita, Hidemasa; Tomiyama, Hitoshi; and Mori, Shigeyasu, to Chiyoda Chemical Engineering & Construction Co., Ltd. Apparatus and method for treating waste gas from urea prilling tower. 4,104,041, Cl. 55-90.000.

Arkosy, Steven. Method utilizing an automatic resettable circuit breaker for locating ground faults in a vehicle. 4,104,581, Cl. 324-52.000.

Arlt, Dieter; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. Disubstituted-O-(1-fluoro-2-halogenoethyl)-phosphoric(phosphonic) acid esters, and method of combating insects. 4,104,377, Cl. 424-222.000.

Armstrong Cork Company: *See—*
Herweh, John E., 4,104,301, Cl. 260-554.000.

Armstrong, James J., to Texas Instruments Incorporated. Keyboard apparatus including elongated bar for aligning level from connectors to motherboard. 4,104,702, Cl. 361-421.000.

Arndt, John J., to Anderson Company, The. Locking clip. 4,103,386, Cl. 15-250.420.

Arnholt, Jack C.; and Main, Ronald J., to Rohr Industries, Incorporated. Folding seat and wheelchair restraint. 4,103,934, Cl. 280-744.000.

Arnold, Douglas L. Odorless water closet. 4,103,370, Cl. 4-213.000.

Arnold, Gunther: *See—*
Krafft, Werner; Arnold, Gunther; Paal, Gabor; and Vollmer, Hans-Peter, 4,104,067, Cl. 96-1.50R.

Arnold, James F. Method for inhibiting the wear in a well casing. 4,103,748, Cl. 175-61.000.

Aro Corporation, The: *See—*
Arvin, Paul, 4,103,711, Cl. 137-625.660.

Aronson, Harmon J., to Biosonics, Inc. Method and apparatus for measuring blood flow noninvasively. 4,103,679, Cl. 128-2.05F.

Arrow Hart Inc.: *See—*
Phillips, Bernard L., 4,104,506, Cl. 219-85.0CM.

Arvin, Paul, to Aro Corporation, The. Fluid logic flip-flop. 4,103,711, Cl. 137-625.660.

Asahi Yukizai Kogyo Kabushiki Kaisha: *See—*
Nanba, Kamori; Ueda, Tomoyuki; and Matsuda, Tetsunori, 4,103,865, Cl. 251-148.000.

Asano Pole Co., Ltd.: *See—*
Kobayashi, Kazuaki; Takaha, Noboru; and Katsuragi, Masao, 4,104,077, Cl. 106-88.000.

Ascani, Armand: *See—*
Walker, Louis, 4,103,599, Cl. 98-33.00A.

Aschermann, Heinz: *See—*
Hoffmann, Ernst; Reimann, Siegfried; and Aschermann, Heinz, 4,104,008, Cl. 417-397.000.

ASEA AB: *See—*
Elvin, Sten, 4,104,537, Cl. 307-58.000.
Frank, Harry, 4,104,576, Cl. 323-102.000.

Aseltine, William S.: *See—*
Baier, Robert J.; Anderson, Vern; and Aseltine, William S., 4,103,692, Cl. 131-32.000.

Ashland Oil, Inc.: *See—*
Trivedi, Bhupendra C., 4,104,478, Cl. 568-885.000.

Ashlow Steel & Engineering Company Limited: *See—*
Jackson, John Charles; and Selous, Percy Bruce Gordon, 4,103,577, Cl. 83-337.000.

Ashworth, Roger Anderton; Pollitt, John Michael; and White, Graham Colin, to Kangol Magnet Limited. Protection of occupants of a vehicle. 4,103,754, Cl. 180-82.00C.

Aslin, Michael: *See—*
Dix, James Allen; Guettel, Marvin A.; and Aslin, Michael, 4,104,724, Cl. 364-477.000.

Astrom, Gordon L.: *See—*
Jones, William H.; and Astrom, Gordon L., 4,104,495, Cl. 200-83.00P.

Atari, Inc.: *See—*
Bristow, Stephen D.; and Bushnell, Nolan K., 4,104,625, Cl. 340-324.00R.

Ateliers des Charmilles S.A.: *See—*
Wyss, Georges, 4,104,500, Cl. 219-69.00V.
Wyss, Georges, 4,104,501, Cl. 219-69.00M.

Ateliers et Chantiers de Bretagne-A.C.B., Societe Anonyme: *See—*
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,103,500, Cl. 61-69.00R.

Atkins & Merrill, Inc.: *See—*
Fleming, Gordon R., 4,104,555, Cl. 313-512.000.

Atlantic Richfield Company: *See—*
Chao, Tai S.; and Owston, Ernest H., Jr., 4,104,036, Cl. 44-56.000.
Erickson, Henry, 4,104,153, Cl. 208-138.000.

Atlas Copco Aktiebolag: *See—*
Denisart, Jean-Paul; Edney, Barry E.; and Young, Chapman, 4,103,971, Cl. 299-17.000.

Atlas Powder Company: *See—*
Bast, Bernard John; and Schaffer, Howard Elias, 4,103,473, Cl. 53-180.00M.
Mullay, John J., 4,104,092, Cl. 149-2.000.

Audisio, Giorgio: *See—*
Cargnino, Francesco; and Audisio, Giorgio, 4,104,139, Cl. 204-55.00R.

Automatic Container Loading Limited: *See—*
Miller, Dennis M., 4,103,795, Cl. 214-621.000.

Avery, Dudley D.: *See—*
Garside, Arthur F.; and Avery, Dudley D., 4,103,652, Cl. 123-103.00R.

Avon Enterprises, Inc.: *See—*
Vik, Albam M., 4,103,699, Cl. 137-106.000.

Awad, John A.: *See—*
Lupien, Paul J.; Awad, John A.; and Moorjani, Sital, 4,103,685, Cl. 128-214.00R.

Aydelott, Max M.; Hartman, Richard L.; and York, James A., to Smith Engineering Company. Replaceable inlet means for heat exchanger. 4,103,738, Cl. 165-178.000.

Azorlosa, Julian L., to GAF Corporation. Multifunctional acrylate N-vinylamide anaerobic adhesive composition. 4,104,458, Cl. 526-264.000.

B. F. Goodrich Company, The: *See—*
Lai, John Ta-Yuan, 4,104,254, Cl. 260-45.8NZ.

B & K Industries Ltd.: *See—*
Shaw, Robert, 4,103,794, Cl. 214-518.000.

B & W Manufacturing Co., Inc.: *See—*
Boser, Ronald J., 4,103,562, Cl. 74-567.000.

Bacardit, Juan Simon: *See—*
Elizalde, Manuel Coll; and Bacardit, Juan Simon, 4,103,407, Cl. 29-157.10R.

Bachman, Charles: *See—*
Poublan, Alain; Bachman, Charles; and Bouvard, Jacques, 4,104,718, Cl. 364-200.000.

Backer, Wolfgang; Wojahn, Heinzbert; Esser, Hans-Theo; Feltgen, Karlheinz; and Weisbeck, Roland, to Bayer Aktiengesellschaft. Nozzle device for the production of texturized filament yarns. 4,103,404, Cl. 28-255.000.

Bahder, George; Eager, George S., Jr.; Dima, Attila F.; and Walker, James J., to General Cable Corporation. Stop joint for laminar dielectric cable. 4,104,479, Cl. 174-22.00R.

Baier, Robert J.; Anderson, Vern; and Aseltine, William S., to Gulf & Western Corporation. Cigar wrapping machine and method. 4,103,692, Cl. 131-32.000.

Bailey, James R. Time indicating device. 4,103,484, Cl. 58-125.00C.

Baker, Donald C., to J. I. Case Company. Vehicle with improved steering system. 4,103,561, Cl. 74-552.000.

Baker, Edward D.: *See—*
Hemborg, Goeran; Green, Winje; Lang-ree, Nils; and Baker, Edward D., 4,103,605, Cl. 99-345.000.

Baker International Corporation: *See—*
Akkerman, Neil H., 4,103,744, Cl. 166-324.000.
Labit, Sidney James; and Furmaga, Robert Edwin, 4,103,710, Cl. 137-624.130.

Baker Perkins Holdings Limited: *See—*
Edwards, Albert, 4,103,733, Cl. 164-160.000.

Baker Perkins Inc.: *See—*
Fischer, Harry A.; and Wrubel, Richard R., 4,104,412, Cl. 426-572.000.

Baker, Robert Lee; Mahoski, Calvin Michael; Partilla, John David; and Ronan, Harold Robert, Jr., to RCA Corporation. Chuck for use in the testing of semiconductor wafers. 4,104,589, Cl. 324-158.00F.

Bakul, Valentin Nikolaevich: *See—*
Fedoseev, Dmitry Valerianovich; Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; Varnin, Valentin Pavlovich; Vnukov, Stanislav Pavlovich; Gerasimenko, Valentin Korneevich; Nikitin, Jury Ivanovich; Tsypin, Nekhemyan Veniaminovich; and Hochko, Anatoly Vasilievich, 4,104,441, Cl. 428-408.000.

Balcke-Durr Aktiengesellschaft: *See—*
Joekel, Alfred, 4,103,408, Cl. 29-157.3AH.

Baldwin, John J.; and Novello, Frederick C., to Merck & Co., Inc. 1,3,5-Trisubstituted-1,2,4-triazole compounds. 4,104,393, Cl. 424-263.000.

Ballesteros, Juan Carlos Corral, to Suilene Argentina S.A. Sponge. 4,104,435, Cl. 428-288.000.

Baltimore and Ohio Railroad Company, The: *See—*
Spatig, Thomas G., 4,103,817, Cl. 228-173.00C.

Bank, Thomas A.; Gieck, Jack E.; and Weitzenhof, David A., to Firestone Tire & Rubber Company, The. Semi-pneumatic energy absorbing bumper system for motor vehicles. 4,103,951, Cl. 293-71.00P.

Banka, Eugene F.: *See—*
Lehner, Gerald J.; and Banka, Eugene F., 4,104,682, Cl. 360-2.000.

Banks, Reginald George Sinclair; Paterson, David James; and Williams, Alan, to British Gas Corporation. Catalytic steam reforming and catalysts therefor. 4,104,201, Cl. 252-466.00B.

Bannan, Edward C., to McGraw-Edison Company. Aluminum cluster mount. 4,103,853, Cl. 248-219.100.

Banning, Jack A., to Phillips Fibers Corporation. Apparatus for winding an improved yarn supply package. 4,103,834, Cl. 242-18.0PW.

Bar-On, Benjamin; and Paz, Eldad. Solar collectors. 4,103,675, Cl. 126-271.000.

Barabash, Martin J.: *See—*
Barker, Graham; and Barabash, Martin J., 4,104,403, Cl. 424-365.000.

Baran, John S.; and Laos, Ivar, to G. D. Searle & Co. 11β,18-epoxy-9α-halo-17,18-dihydroxy-3-oxo-17α-pregn-4-ene-21-carboxylic acid γ-lactones and congeners. 4,104,271, Cl. 260-239.570.

Baranowski, Conrad J., to Powercube Corporation. Mounting assembly for electronic power devices. 4,104,701, Cl. 361-386.000.

Bargain, Michel; and Lagarde, Robert, to Rhone-Poulenc Industries. Organopolysiloxane compositions transformable into elastomers without use of vulcanizing agents. 4,104,239, Cl. 260-37.0SB.

Barker, D. F.: *See—*
Brandenburger, A. M.; Helms, C. R.; and Barker, D. F., 4,103,770, Cl. 206-193.000.

Barker, Graham; and Barabash, Martin J., to Witco Chemical Corporation. Water-oil emulsions and method of preparing same. 4,104,403, Cl. 424-365.000.

Barker, Philip Edwin; Hatt, Brian William; and Ellison, Frederick John, to Fisons Limited. Method for separation of dextrans. 4,104,078, Cl. 127-46.00R.

Barnerias, Jean; Johnson, Anthony E.; and Weimar, Erich, to Draftex Development AG. Channel-shaped sealing strips. 4,103,459, Cl. 49-491.000.

Barnes-Hind Pharmaceuticals, Inc.: *See—*
Sibley, Murray J.; Yung, Gordon H. K.; and Urrea, Petronio D., 4,104,187, Cl. 252-106.000.

Baron Chalmalla SA: *See—*
Belpaume, Charles, 4,103,360, Cl. 2-67.000.

Baron, Robert Michael. Adjustable U-control handle. 4,103,453, Cl. 46-77.000.

Barreau, Michel; Cotrel, Claude; and Jeanmart, Claude, to Rhone-Poulenc Industries. Derivatives of 1,2-dithiole and anti-bilharzia compositions thereof. 4,104,386, Cl. 424-250.000.

Barrett, Edward George, to Smiths Industries Limited. Driving mechanisms. 4,103,515, Cl. 64-26.000.

Barricks, Arthur G. Table with foldable legs. 4,103,626, Cl. 108-127.000.

Barron, Roger S.: *See—*
Wu, Kent Yengtsu; and Barron, Roger S., 4,104,034, Cl. 44-10.00R.

BASF Aktiengesellschaft: *See—*
Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Horn, Peter, 4,104,287, Cl. 260-404.000.
Keppler, Hans Georg; Sander, Bruno; Moeller, Rolf; Bonitz, Eckhard; and Simmler, Werner, 4,104,341, Cl. 264-9.000.
Koenig, Karl-Heinz; and Hamprecht, Gerhard, 4,104,298, Cl. 260-543.00R.
Kranz, Joachim; Jettmar, Werner; and Polster, Rudolf, 4,104,276, Cl. 260-314.500.
Melzer, Jaroslav; and Schenck, Hans-Uwe, 4,104,226, Cl. 260-29.6WB.
Pommer, Ernst-Heinrich; Gutsche, Klaus; and Hartleben, York, 4,104,399, Cl. 424-269.000.
Reuther, Wolfgang; Oppenlaender, Knut; Raff, Paul; Pommer, Ernst-Heinrich; and Siegler, Manfred, 4,104,374, Cl. 424-185.000.
Swoboda, Johann; Stephan, Rudolf; and Heinz, Gerhard, 4,104,328, Cl. 260-876.00R.

Bast, Bernard John; and Schaffer, Howard Elias, to Atlas Powder Company. Apparatus for making a compartmented container. 4,103,473, Cl. 53-180.00M.

Batz, Walter, to Jones & Laughlin Steel Corporation. Method of making differentially coated one side alloyed galvanized steel strip. 4,104,088, Cl. 148-12.00R.

Baudin, Pol: *See—*
Nolte, Hans-Henning; De Boel, Marcel; and Baudin, Pol, 4,104,427, Cl. 428-68.000.

Bauer, Hubert, to Messerschmitt-Boelkow-Blohm GmbH. Constant current semiconductor circuit arrangement. 4,104,575, Cl. 323-4.000.

Bautex Adolf Stover KG.: *See—*
Spohr, Horst, 4,103,727, Cl. 160-168.00R.

Baxter Travenol Laboratories, Inc.: *See—*
Hopkins, Robert E., II; and Hughes, Kathleen, 4,104,030, Cl. 23-230.00B.

Bayer Aktiengesellschaft: *See—*
Arlt, Dieter; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,104,377, Cl. 424-222.000.
Backer, Wolfgang; Wojahn, Heinzbert; Esser, Hans-Theo; Feltgen, Karlheinz; and Weisbeck, Roland, 4,103,404, Cl. 28-255.000.
Botta, Artur; and Rasp, Christian, 4,104,194, Cl. 252-390.000.
Dorsch, Hans-Lothar; and Raue, Roderich, 4,104,268, Cl. 260-158.000.
Hohmann, Walter; Herzog, Helmut; and Bien, Hans-Samuel, 4,104,284, Cl. 260-378.000.
Ley, Kurt; Hagemann, Hermann; and Hurnik, Helmut, 4,104,195, Cl. 252-350.000.
Mansmann, Manfred, 4,104,045, Cl. 65-2.000.
Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; and Lurssen, Klaus, 4,104,049, Cl. 71-76.000.
Pettelkau, Hans-Jurgen, 4,104,272, Cl. 260-27.0BB.
Radlmann, Eduard; Gelhaar, Hans-Georg; and Nischk, Gunther, 4,104,324, Cl. 260-857.0TW.
Rellensmann, Wolfgang; Bueb, Michael; Rupprecht, Lothar; Schmidt, Herbert; and Wagner, Wolfram, 4,103,480, Cl. 57-140.00R.
Rohe, Lothar; Schramm, Jurgen; Klauke, Erich; Eue, Ludwig; and Schmidt, Robert Rudolf, 4,104,313, Cl. 260-612.00R.
Scharfe, Gerhard; and Wenzel, Rupert, 4,104,316, Cl. 260-655.000.

Baysinger, Robert L., to Emerson Electric Co. Cycling pilot burner control system with safety timing. 4,104,016, Cl. 431-54.000.

Bean, Lawrence M.; Edwards, Robert W.; and Wright, Theodore, to Westinghouse Electric Corp. Control panel system. 4,104,617, Cl. 340-147.00R.

Bean, Lloyd F., to Xerox Corporation. Recording plate. 4,103,994, Cl. 355-3.00R.

Beatrice Foods Co.: *See—*
Jones, John H.; Schoenleber, Donald W.; and Grainger, Frederick, 4,103,444, Cl. 40-124.100.

Beck, James Richard, to Eli Lilly and Company. N^1-chloro-3,5-dinitrosulfanilamides. 4,104,054, Cl. 71-103.000.

Beckmann, Peter V.; and Kelly, James B., to United Technologies Corporation. Turbine engine surge detector. 4,103,544, Cl. 73-115.000.

Bedford, William Augustus, Jr.: *See—*
Mitchell, Ronald A.; and Bedford, William Augustus, Jr., 4,103,524, Cl. 70-209.000.

Bednarski, John R.; and Russell, David B., to M&T Chemicals Inc. Novel biologically active copolymers. 4,104,234, Cl. 260-33.6UA.

Bednorz, Klaus; Johansen, Jon W.; and Scheidel, Fritz, to Siemens Aktiengesellschaft. Semiconductor device with pressure electrical contacts having irregular surfaces. 4,104,676, Cl. 357-79.000.

Beduhn, Daniel E.; Morrow, James G., Sr.; and Pech, David J., to Manitowoc Company, Inc., The. Platform crane with counterweight and boom carrier support linkages. 4,103,783, Cl. 212-48.000.

Behnke, Joachim: *See*—
del Rio, Marija; Behnke, Joachim; Wallrabenstein, Michael; and Frank, Dieter, 4,104,258, Cl. 528-334.000.
Behrenz, Wolfgang: *See*—
Arlt, Dieter; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,104,377, Cl. 424-222.000.
Bei Electronics, Inc.: *See*—
Foley, Nelson D., 4,103,585, Cl. 89-1.814.
Belhomme, Charles Joseph Ghislain: *See*—
Van Bokestal, Andre Marcel Alfred; and Belhomme, Charles Joseph Ghislain, 4,104,509, Cl. 219-544.000.
Bell, Richard Judd: *See*—
Wynn, John Dee; Denton, George Terrance; Bell, Richard Judd; Vernon, Harry Rowe; and Custer, Lloyd Roy, 4,104,413, Cl. 426-582.000.
Bell Telephone Laboratories, Incorporated: *See*—
DiLorenzo, James Vincent; Mahoney, Gerard Edward; and Moran, Joseph Michael, 4,104,672, Cl. 357-22.000.
Grau, Thomas George; and Tompsett, David Elliott, 4,104,109, Cl. 156-521.000.
Ngo, Peter Dinh-Tuan, 4,104,626, Cl. 340-324.00M.
Belpaume, Charles, to Baron Chalmalla SA. Woman's garment which molds the upper body. 4,103,360, Cl. 2-67.000.
Bendix Corporation, The: *See*—
Brown, Arthur K., Jr., 4,103,593, Cl. 92-78.000.
Elizalde, Manuel Coll; and Bacardit, Juan Simon, 4,103,407, Cl. 29-157.10R.
Putt, James Basil, 4,103,590, Cl. 91-376.00R.
Benjamin, Adrian; Churgin, Walter G.; Biermann, Frederick; Benjamin, David W.; Cordell, Finton P.; Tempkin, Robert M.; Zambrano, Carl A.; and Halasz, Peter, to Bergen Brunswig Corporation. Dental articulation apparatus and method. 4,103,424, Cl. 32-32.000.
Benjamin, David W.: *See*—
Benjamin, Adrian; Churgin, Walter G.; Biermann, Frederick; Benjamin, David W.; Cordell, Finton P.; Tempkin, Robert M.; Zambrano, Carl A.; and Halasz, Peter, 4,103,424, Cl. 32-32.000.
Benois, Hugues G., to Airco, Inc. High speed freezing system. 4,103,507, Cl. 62-63.000.
Benoit, Roland A.; and Guillot, Edmund P., to InterRoyal Corporation. Safety side for hospital bed. 4,103,376, Cl. 5-331.000.
Benz, Willi, to Schloemann-Siemag Aktiengesellschaft. Flying cross cutting shear for plate. 4,103,576, Cl. 83-320.000.
Berard, Jean Claude, to SEB S.A. Cooking container, especially for frying food products. 4,103,604, Cl. 99-342.000.
Berard, Michel; and Lecoustey, Andre, to Cefilac. Modular kinematic chain for transmitting a torque with slip. 4,103,568, Cl. 74-801.000.
Bergen Brunswig Corporation: *See*—
Benjamin, Adrian; Churgin, Walter G.; Biermann, Frederick; Benjamin, David W.; Cordell, Finton P.; Tempkin, Robert M.; Zambrano, Carl A.; and Halasz, Peter, 4,103,424, Cl. 32-32.000.
Bergmann, Karl H.; and Levine, Harvey, to Melitta, Inc. Automatic coffee brewing device. 4,103,603, Cl. 99-294.000.
Bergs, Andrew. Fireplace heat intensifier. 4,103,670, Cl. 126-121.000.
Bergwerksverband GmbH: *See*—
Ratz, Walter; and Lindemann, Werner, 4,104,592, Cl. 325-37.000.
Romey, Ingo; Kolling, Georg; and Kokot, Hellmut, 4,104,150, Cl. 208-91.000.
Bernard, Jean Rene; and Nury, Jean, to Elf-Union. Method of dehydrocyclizing aliphatic hydrocarbons. 4,104,320, Cl. 260-673.500.
Bernecker, Gunther, to Conlin, Donald B., a part interest. Carburetor. 4,103,658, Cl. 123-133.000.
Bernett, Marianne K., to United States of America, Navy. Vinyl polymer-fluoroalkylether oligomer composition. 4,104,452, Cl. 526-3.000.
Bernstein, Edith; Chu, Daniel Tim-Wo; and Huckin, Stuart Nicholas, to Abbott Laboratories. 12a-Deoxy chelocardin. 4,104,306, Cl. 260-571.000.
Berntsen, Robert A.: *See*—
Stoffel, Robert W.; and Berntsen, Robert A., 4,103,560, Cl. 74-501.00M.
Bernzomatic Corporation: *See*—
Zagara, Frank A.; and Nelson, John M., 4,103,829, Cl. 239-304.000.
Bertetti, John W. Method and apparatus for determining vehicle fuel consumption. 4,103,543, Cl. 73-114.000.
Bertin & Cie: *See*—
Duthion, Louis; Bonnet, Pierre; and Coudray, Paul Amand Louis, 4,103,702, Cl. 137-375.000.
Besenbruch, Alex, to Besenbruch-Hofmann, Inc. Grinding tools for cylinders. 4,103,461, Cl. 51-352.000.
Besenbruch-Hofmann, Inc.: *See*—
Besenbruch, Alex, 4,103,461, Cl. 51-352.000.
Besik, Ferdinand. Apparatus for purifying waste waters. 4,104,167, Cl. 210-195.00S.
Beyl, Jean Joseph Alfred. Ski binding. 4,103,929, Cl. 280-611.000.
BFG Glassgroup: *See*—
Nolte, Hans-Henning; De Boel, Marcel; and Baudin, Pol, 4,104,427, Cl. 428-68.000.
Bidler, James L., to Minnesota Mining and Manufacturing Company. Porous lubricant-impregnated bearing. 4,104,176, Cl. 252-12.200.
Bieler, Anne C.; and Schirmer, Henry G., to W. R. Grace & Co. Cross-linked amide/olefin polymeric tubular film coextruded laminates. 4,104,404, Cl. 428-35.000.
Bien, Hans-Samuel: *See*—
Hohmann, Walter; Herzog, Helmut; and Bien, Hans-Samuel, 4,104,284, Cl. 260-378.000.
Biermann, Frederick: *See*—
Benjamin, Adrian; Churgin, Walter G.; Biermann, Frederick; Benjamin, David W.; Cordell, Finton P.; Tempkin, Robert M.; Zambrano, Carl A.; and Halasz, Peter, 4,103,424, Cl. 32-32.000.
Billion S.A.: *See*—
Monnet, Bernard Leon, 4,104,353, Cl. 264-255.000.
Bills, Franklin Deloy, to Elkhart Products Corporation. Branch fitting for a pipe. 4,103,940, Cl. 285-189.000.
Bilson, Edward A.: *See*—
Fountain, Gerald F.; Veloz, Jaime; Bilson, Edward A.; and Cronin, John A., 4,104,157, Cl. 209-166.000.
Biosonics, Inc.: *See*—
Aronson, Harmon J., 4,103,679, Cl. 128-2.05F.
Bischoff, William Frederick: *See*—
Steiner, Peter; and Bischoff, William Frederick, 4,103,902, Cl. 277-12.000.
Bjorksten Research Laboratories, Inc.: *See*—
Dunn, Stanley A.; and Paquette, Elmer G., 4,104,355, Cl. 264-290.00R.
Black, James Whyte; and Parsons, Michael Edward, to Smith Kline & French Laboratories Limited. Pharmaceutical compositions and methods of inhibiting H-1 and H-2 histamine receptors. 4,104,382, Cl. 424-247.000.
Black, Robert B. Supporting or stabilizing device. 4,103,625, Cl. 108-44.000.
Blair, Edgar Allan, to Monster Molding, Inc. Method of rotational molding about plural axes at low rotational speeds. 4,104,357, Cl. 264-255.000.
Blakeman, Carl E. Billiard glove. 4,103,362, Cl. 2-161.00A.
Blank, Wilhelm; and Roth, Ernst, to Klein, Schanzlin & Becker AG. Means for collecting moisture in canned electric motors. 4,104,551, Cl. 310-88.000.
Bless, Stephan J.: *See*—
Trulio, John G.; and Bless, Stephan J., 4,103,756, Cl. 181-121.000.
Blizzard, John D.; and Monroe, Carl M., to Dow Corning Corporation. Process for shaping low durometer siloxane elastomers containing polytetrafluoroethylene powder. 4,104,351, Cl. 264-236.000.
Bloch, Maurice, to Smith Kline & French Laboratories Limited. Method of treating magnesium/potassium depletion. 4,104,370, Cl. 424-153.000.
Block, Dieter, to Electroacustic GmbH. Echo-sounding recorder with different depth-measuring ranges. 4,104,643, Cl. 346-17.000.
Block, Robert S.: *See*—
Martin, John R.; and Block, Robert S., 4,104,486, Cl. 179-2.0AM.
Blomberg, Richard Nelson: *See*—
Angelo, Rudolph John; Blomberg, Richard Nelson; Boettcher, Fritz Peter; Ikeda, Richard Masayoshi; and Samuels, Michael Robert, 4,104,438, Cl. 428-332.000.
Blount, David H. Process for the production of poly(allylhalide-allyl alcohol). 4,104,456, Cl. 526-194.000.
Blu, Gilbert; and Lazarre, Flavien, to Societe Nationale Elf Aquitaine (Production). Device for dispersing exhaust gases. 4,103,707, Cl. 137-604.000.
Blum, Gunther; and Stark, Gerhard, to Stama Stark Maschinenfabrik Gotthilf Stark. Tool changing arrangement. 4,103,405, Cl. 29-26.00A.
Blumcraft of Pittsburgh: *See*—
Horgan, William J., Jr., 4,103,874, Cl. 256-24.000.
Blumenthal, John; and Brown, Arling Dix, Jr., to Gould Inc. Electric spark recording. 4,104,648, Cl. 346-163.000.
Boessler, Hanns; Elser, Wilhelm; Huebner, Klaus; and Ottofrickenstein, Hans, to Rohm GmbH. Film forming aqueous synthetic resin dispersions and paints prepared therefrom. 4,104,227, Cl. 260-29.6HN.
Boettcher, Fritz Peter: *See*—
Angelo, Rudolph John; Blomberg, Richard Nelson; Boettcher, Fritz Peter; Ikeda, Richard Masayoshi; and Samuels, Michael Robert, 4,104,438, Cl. 428-332.000.
Boggs, Ronald M.: *See*—
Lomax, Donald P.; and Boggs, Ronald M., 4,103,800, Cl. 138-145.000.
Bohli, William H., to United States of America, Navy. Shrouded chemical light source. 4,104,708, Cl. 362-34.000.
Bohnstedt, Werner; and Stommel, Manfred, to Electrochem, Inc. Pri-

mary battery of the remotely activated type. 4,104,449, Cl. 429-110.000.

Bohringer, Walter: *See—*
Forster, Gerhard; and Bohringer, Walter, 4,104,569, Cl. 315-408.000.

Bolen, Charles E.: *See—*
Roberts, Michael G.; Strauss, Carl R.; and Bolen, Charles E., 4,104,241, Cl. 260-40.00R.

Boltze, Karl-Heinz; Brendler, Otfried; and Seidel, Peter-Rudolf, to Troponwerke Dinklage & Co. Process for the production of compounds with antiphlogistic activity. 4,104,278, Cl. 260-326.13A.

Bondur, James Allan; and Pogge, Hans Bernhard, to International Business Machines Corporation. Method for forming isolated regions of silicon utilizing reactive ion etching. 4,104,086, Cl. 148-1.500.

Bonitz, Eckhard: *See—*
Keppler, Hans Georg; Sander, Bruno; Moeller, Rolf; Bonitz, Eckhard; and Simmler, Werner, 4,104,341, Cl. 264-9.000.

Bonnet, Pierre: *See—*
Duthion, Louis; Bonnet, Pierre; and Coudray, Paul Amand Louis, 4,103,702, Cl. 137-375.000.

Booker, Ernest R., to Plan Partitions Limited. Securing of doorways. 4,103,458, Cl. 49-56.000.

Borello, Domenic. Electric motor for general purposes (II). 4,104,548, Cl. 310-14.000.

Borg-Warner Corporation: *See—*
Boyer, Nicodemus E., 4,104,250, Cl. 260-45.8NT.
Gay, Robert L.; Schlott, Richard J.; and Burroughs, James E., 4,104,173, Cl. 252-8.55R.
Hechenbleikner, Ingenuin; and Enlow, William Palmer, 4,104,252, Cl. 260-45.80R.
Holdeman, John William, 4,103,753, Cl. 180-49.000.
Overzet, John Kenneth, 4,104,595, Cl. 328-1.000.

Borsig Gesellschaft mit beschrankter Haftung: *See—*
Hoffman, Michael; and Pape, Rolf, 4,103,909, Cl. 277-101.000.

Boser, Ronald J., to B & W Manufacturing Co., Inc. Sewing apparatus. 4,103,562, Cl. 74-567.000.

Botta, Artur; and Rasp, Christian, to Bayer Aktiengesellschaft. Method for protecting metal from erosion. 4,104,194, Cl. 252-390.000.

Bottum, Edward W. Water heater-dehumidifier combination heat pump. 4,103,509, Cl. 62-238.000.

Boudreaux, Lee J.; and Foster, James H., to General Electric Company. Thin film strain gauge and method of fabrication. 4,104,605, Cl. 338-2.000.

Boujard, Claude; and Vilaldach, Joseph. Lifting device for use in a liquid medium. 4,104,082, Cl. 134-141.000.

Bouloy, Jose B. Safety door latch. 4,103,949, Cl. 292-342.000.

Bouvard, Jacques: *See—*
Poublan, Alain; Bachman, Charles; and Bouvard, Jacques, 4,104,718, Cl. 364-200.000.

Bowen, David James: *See—*
Grenfell, Hugh Willmott; and Bowen, David James, 4,104,058, Cl. 75-60.000.

Bowles, Theodore L., to Singer Company, The. Stepping motor shaft position determining arrangement. 4,103,632, Cl. 112-158.00E.

Boyd, Byron W.: *See—*
Davidson, Amber Charles, 4,103,519, Cl. 68-3.0SS.

Boyer, Nicodemus E., to Borg-Warner Corporation. Flame-retardant polymers with 1,3,5-triazines having halo- and halo-aryl substitutents. 4,104,250, Cl. 260-45.8NT.

Bradburn, Robert A., to United States of America, Interior. Current limiting circuit for direct current power supplies. 4,104,544, Cl. 307-297.000.

Bradshaw, Gary W. Display rack. 4,103,778, Cl. 211-47.000.

Braid, Murray D. Log splitting machine. 4,103,724, Cl. 144-193.00A.

Brailsford, Gerold Wayne. Mixer apparatus. 4,104,737, Cl. 366-65.000.

Brandenburger, A. M.; Helms, C. R.; and Barker, D. F., to Container Corporation of America. Carton with transverse partition and method of assembling same. 4,103,770, Cl. 206-193.000.

Brandhorst, Henry W., Jr.: *See—*
Evans, John C., Jr.; Brandhorst, Henry W., Jr.; Mazaris, George A.; and Scudder, Larry R., 4,104,091, Cl. 148-188.000.

Brannan, James R.; Malkin, Irving; and Brown, Claude M., to Diamond Shamrock Corporation. Method of in situ plating of an active coating on cathodes of alkali halide electrolysis cells. 4,104,133, Cl. 204-25.000.

Braswell, John W. Water softening system. 4,104,165, Cl. 210-191.000.

Bratton, Francis H.: *See—*
Liu, William Chang; Bratton, Francis H.; and Nali, Robert Ronald, 4,104,428, Cl. 428-85.000.

Braun, Ernst; and Braun, Gert, to Halbach and Braun. Crusher having rotatable arms with striker tools and liquid spray means. 4,103,832, Cl. 241-38.000.

Braun, Gert: *See—*
Braun, Ernst; and Braun, Gert, 4,103,832, Cl. 241-38.000.

Brealey, Robert Harwood, to General Electric Company. Disconnect contact assembly for metal-clad switchgear and the like. 4,104,497, Cl. 200-305.000.

Breger, Joseph L.; and Stemmle, Joseph A., to Breger-Mueller Welt Corp. Corneal contact lens and method of making the same. 4,103,992, Cl. 351-160.000.

Breger-Mueller Welt Corp.: *See—*
Breger, Joseph L.; and Stemmle, Joseph A., 4,103,992, Cl. 351-160.000.

Brehant, Jean-Louis Marie: *See—*
Duc, Nguyen-Cong; Brehant, Jean-Louis Marie; Pons, Benoit-Joseph; and Sechet, Maurice Henri, 4,104,123, Cl. 195-31.00P.

Breindel, Kenneth: *See—*
Mahn, Frederick; Breindel, Kenneth; Scanley, Clyde; and Sexsmith, David, 4,104,033, Cl. 23-300.000.

Brekle, Erich: *See—*
Herb, Eugen; and Brekle, Erich, 4,103,414, Cl. 29-568.000.

Brendler, Otfried: *See—*
Boltze, Karl-Heinz; Brendler, Otfried; and Seidel, Peter-Rudolf, 4,104,278, Cl. 260-326.13A.

Bressler, Wilbur L.: *See—*
May, James A., Jr.; and Bressler, Wilbur L., 4,104,198, Cl. 252-429.00B.

Bridge, John Gardiner. Chimney cap. 4,103,600, Cl. 98-66.00R.

Brigham Young University: *See—*
Pope, Bill J.; Horton, M. Duane; and Hall, H. Tracy, 4,104,344, Cl. 264-42.000.

Brilando, Frank P., to Schwinn Bicycle Company. Quick-release hub retention device. 4,103,922, Cl. 280-279.000.

Briscoe, Harry H.: *See—*
Tucker, Samuel M., 4,103,390, Cl. 28-173.000.

Bristol-Myers Company: *See—*
Naito, Takayuki; Okumura, Jun; and Iimura, Seiji, 4,104,469, Cl. 544-27.000.

Bristow, Stephen D.; and Bushnell, Nolan K., to Atari, Inc. Apparatus for providing facial image animation. 4,104,625, Cl. 340-324.00R.

British Gas Corporation: *See—*
Banks, Reginald George Sinclair; Paterson, David James; and Williams, Alan, 4,104,201, Cl. 252-466.00B.
Keene, David Edward; and Douglas, Anthony Frederick, 4,104,211, Cl. 260-8.000.

British Railways Board: *See—*
Gibson, John George; and Tilley, Alec Roger, 4,104,448, Cl. 429-72.000.

British Steel Corporation: *See—*
Grenfell, Hugh Willmott; and Bowen, David James, 4,104,058, Cl. 75-60.000.

Brizgys, Peter V.: *See—*
Anders, Dale F.; Brizgys, Peter V.; Mattiuz, Ronald; and Murphy, Edward J., 4,104,100, Cl. 204-181.00R.

Brocoff, Jack, to Ralph M. Parsons Co. Hydrogen generation from flue gases. 4,104,191, Cl. 252-188.000.

Brodeur, Lester R., to Sanders Associates, Inc. LORAN-C navigation apparatus. 4,104,635, Cl. 343-103.000.

Broering, Leo H.; and Duncan, Gary W., to National Distillers and Chemical Corporation. Melt dispersion saponification of ethylene-vinyl acetate polymer. 4,104,453, Cl. 526-10.000.

Bronicki, Yehuda L., to Ormat Turbines (1965) Ltd. Hybrid electric power generating system. 4,104,535, Cl. 290-52.000.

Brooker, Gary; Terasaki, Wesley L.; and Price, Michael G., to University of Virginia. Immunoassay separation technique. 4,104,026, Cl. 23-230.00B.

Brooks, Bertram; and Speed, Eugene, to Carolina Enterprises, Inc. Rear steering toy wheeled vehicle. 4,103,921, Cl. 280-267.000.

Brooks, William T.; and Vincent, Gary A., to Dow Corning Corporation. Electrical devices containing select vinylsiloxane dielectric fluids. 4,104,184, Cl. 252-63.700.

Brown, Arling Dix, Jr.: *See—*
Blumenthal, John; and Brown, Arling Dix, Jr., 4,104,648, Cl. 346-163.000.

Brown, Arthur K., Jr., to Bendix Corporation, The. Hydraulic brake booster and shield therefor. 4,103,593, Cl. 92-78.000.

Brown, Claude M.: *See—*
Brannan, James R.; Malkin, Irving; and Brown, Claude M., 4,104,133, Cl. 204-25.000.

Brown, Eldon W.: *See—*
Jarvis, John R.; and Brown, Eldon W., 4,103,520, Cl. 68-12.00R.

Brown, Jerald L.; and Shelton, John J., to Fife Corporation. Linear support apparatus. 4,103,859, Cl. 248-425.000.

Brown & Williamson Tobacco Corporation: *See—*
Luke, John Anthony, 4,104,431, Cl. 428-211.000.

Brozenick, Nicholas J., to American Air Filter Company, Inc. Multistoried electrostatic precipitator. 4,104,042, Cl. 55-101.000.

Bruckner, Maximiliaan: *See*—
Hoffman, Richard Ernest; and Bruckner, Maximiliaan, 4,103,417, Cl. 29-737.000.

Brues, Friedrich E., to Gold-Zack Werke AG. Elastic warp-knit fabric. 4,103,485, Cl. 66-192.000.

Bruner, Robert L., to CPC International Inc. Non-birefringent granular starch latex thickener. 4,104,212, Cl. 260-17.300.

Brunswick Corporation: *See*—
Liu, William Chang; Bratton, Francis H.; and Nali, Robert Ronald, 4,104,428, Cl. 428-85.000.

Brynjestad, Ulf: *See*—
Woodworth, Robert N.; and Brynjestad, Ulf, 4,103,673, Cl. 126-271.000.

Bucalo, Louis. Article for growing cultures in a body cavity in the presence of gas, and package for the article. 4,104,127, Cl. 195-127.000.

Bucchianeri, Bernard A.; and Senchur, Robert A., to United States Steel Corporation. In-service cleaning of a liquid level sensor. 4,103,552, Cl. 73-309.000.

Buchler, Wilhelm; Muller, Gotthard; and Mende, Hans-Joachim, to Dyckerhoff & Widmann Aktiengesellschaft. Arrangement for the sectional cantilever projection of multi-panel bridge supporting structures of steel or prestressed concrete. 4,103,861, Cl. 249-20.000.

Bueb, Michael: *See*—
Rellensmann, Wolfgang; Bueb, Michael; Rupprecht, Lothar; Schmidt, Herbert; and Wagner, Wolfram, 4,103,480, Cl. 57-140.00R.

Bundy, Gordon L., to Upjohn Company, The. 3,7-Inter-m-phenylene-4,5,6-trinor-9-deoxy-9-methylene-PGF-type compounds. 4,104,476, Cl. 560-61.000.

Bunker Ramo Corporation: *See*—
Krolak, Ronald F.; and Radloff, Frederick J., 4,103,985, Cl. 339-126.00R.

Burakov, Savely Leonidovich: *See*—
Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.

Burchenal, Joseph H.: *See*—
Fox, Jack J.; and Burchenal, Joseph H., 4,104,461, Cl. 536-23.000.

Burdette, Robert E.; and Fuller, Aubrey M. Membrane mounting system for windows. 4,103,728, Cl. 160-368.00R.

Burian, Paul D.; and Sempliner, Arthur T., to Clairol, Inc. Manicuring unit. 4,103,694, Cl. 132-73.600.

Burk, Michael T.: *See*—
Sweany, Louis P.; and Burk, Michael T., 4,104,628, Cl. 340-384.00E.

Burnop, Victor Charles Ernest, to Exxon Research & Engineering Co. Production of overbased metal phenates. 4,104,180, Cl. 252-33.000.

Burron Medical Products, Inc.: *See*—
LeFevre, Robert J., 4,103,686, Cl. 128-214.00R.

Burroughs Corporation: *See*—
Adler, Arnold Henry, 4,103,935, Cl. 283-66.00R.
Hutchison, Robert V.; Gregg, Peter P.; and MacBride, James J., 4,104,700, Cl. 361-384.000.
Lehner, Gerald J.; and Banka, Eugene F., 4,104,682, Cl. 360-2.000.
Rayfield, Wilson Parker; and Jurgensen, Robert H., 4,104,105, Cl. 156-364.000.

Burroughs, James E.: *See*—
Gay, Robert L.; Schlott, Richard J.; and Burroughs, James E., 4,104,173, Cl. 252-8.55R.

Burrows, John: *See*—
Miles, Peter; Hargreaves, James Roger; and Burrows, John, 4,104,423, Cl. 427-402.000.

Bushell, Helen. Maneuverable glider kite. 4,103,850, Cl. 244-153.00R.

Bushnell, Nolan K.: *See*—
Bristow, Stephen D.; and Bushnell, Nolan K., 4,104,625, Cl. 340-324.00R.

Buter, Roelof, to Akzo N.V. High solids pigment coating composition. 4,104,240, Cl. 260-39.00P.

Butterfield, Max E.; and Molnar, John, to Caterpillar Tractor Co. Seat cover. 4,103,968, Cl. 297-219.000.

Buxbaum, Lothar; Kainmuller, Thomas; and Habermeier, Jurgen, to Ciba-Geigy Corporation. Thermoplastic polyesters prepared from dicarboxylic acids containing N-heterocyclic rings. 4,104,297, Cl. 528-289.000.

Buzzi, Carlo. Device for measuring the damping effect of motor vehicle suspensions. 4,103,532, Cl. 73-11.000.

Bylsma, Friedhelm: *See*—
Schafer, Stefan; Gehrmann, Klaus; Ohorodnik, Alexander; Steil, Karl-Heinz; Riechmann, Wernfried; and Bylsma, Friedhelm, 4,104,304, Cl. 260-543.00P.

Bylsma, Simon, to Continental Belton Co. Three point hitch apparatus for supporting an implement underneath a tractor. 4,103,474, Cl. 56-15.900.

Byrd, Carlisle O., Jr., to Johns-Manville Corporation. Refractory fiber blanket module for furnace areas with high gas velocities. 4,103,469, Cl. 52-509.000.

Bytzek, Max: *See*—
Hammer, Klaus-Dieter; Gerigk, Gunter; and Bytzek, Max, 4,104,444, Cl. 428-474.000.

C. I. Hayes Inc.: *See*—
Westeren, Herbert W.; and McCally, Richard P., 4,103,880, Cl. 266-253.000.

C M Industries: *See*—
Krausz, Francois, 4,104,383, Cl. 424-248.400.

Caffarel, Jean-Claude; and Papillon, Bernard, to Rhone-Poulenc Industries. Organosilicon anti-foaming compositions. 4,104,186, Cl. 252-89.00R.

Calderon, Albert. Apparatus for controlling emissions from oxygen steelmaking furnaces. 4,103,879, Cl. 266-158.000.

Calderon, Albert. Coke quenching car. 4,104,130, Cl. 202-230.000.

Caldwell, Samuel I., to Caterpillar Tractor Co. Limited slip differential. 4,103,564, Cl. 74-650.000.

Canada Square Management Ltd.: *See*—
Cooper, Kenneth R., 4,103,598, Cl. 98-31.000.
Moog, Gerhard W.; and Cooper, Kenneth R., 4,103,706, Cl. 137-574.000.

Canada Wire and Cable Limited: *See*—
Parthasarathy, Mellapalayam R.; Nethersole, Douglas C.; and Dudley, Michael A., 4,104,416, Cl. 427-29.000.

Cann, Alfred J., to Sanders Associates, Inc. Modified A. M. detector. 4,104,594, Cl. 325-475.000.

Canon Kabushiki Kaisha: *See*—
Goshima, Takeshi; Sugiura, Yoshinori; Endo, Kiyonobu; Sato, Hideaki; and Kono, Kimio, 4,104,573, Cl. 318-640.000.
Hosoe, Kazuya; Matsumoto, Seiichi; Hashimoto, Shigeru; Iwashita, Tomonori; Fukushima, Tadahide; and Yokota, Hideo, 4,104,650, Cl. 354-25.000.
Hosoe, Kazuya; and Yokota, Hideo, 4,104,652, Cl. 354-25.000.
Matsumoto, Seiichi; Matsuda, Mutsuhide; and Yokota, Hideo, 4,104,651, Cl. 354-25.000.
Tanaka, Katsumi; Hashimoto, Shigeru; Ohtaki, Shohei; Ito, Tadashi; Iwashita, Tomonori; and Kozuki, Susumu, 4,104,649, Cl. 354-289.000.
Uchiyama, Takashi; Sanada, Noriaki; Otaka, Teruo; Komiya, Yoshio; Okuno, Youichi; and Yokota, Hideo, 4,104,658, Cl. 354-106.000.
Yamada, Yu, 4,103,990, Cl. 350-199.000.

Cantatore, Giuseppe, to Montefibre S.p.A. Polyolefine-based polymeric compositions stabilized by organic polyamines, textile fibers obtained therefrom, and novel organic polyamines. 4,104,248, Cl. 260-45.80N.

Capriotti, Alfred J.; Gana, John; and Korpela, Thomas J., to United States Steel Corporation. Fluid actuated sealing arrangement. 4,103,903, Cl. 277-27.000.

Card & Co., Inc.: *See*—
Card, Roy T., 4,103,629, Cl. 112-79.00R.

Card, Roy T., to Card & Co., Inc. Looper apparatus for forming cut pile and loop pile in the same row of stitching in a narrow gauge tufting machine. 4,103,629, Cl. 112-79.00R.

Cardwell, Burton D.: *See*—
Olson, Birger H.; Schuurmans, David M.; Watson, Theodore R.; Shih, Chun-nan; and Cardwell, Burton D., 4,104,369, Cl. 424-115.000.

Cargnino, Francesco; and Audisio, Giorgio, to Hoechst Aktiengesellschaft. Electroplating zinc. 4,104,139, Cl. 204-55.00R.

Carlisle, Richard S. Horticultural method and apparatus. 4,103,457, Cl. 47-58.000.

Carlson, Russell L.: *See*—
Eagon, Beverly M.; Carlson, Russell L.; and Fry, Raymond C., 4,104,102, Cl. 156-298.000.

Carlsson, Bengt Johan, to A B Motala Verkstad. Stroke-limiting arrangement in a multi-cylinder hydraulic press. 4,103,611, Cl. 100-257.000.

Carmen, Hyman, to Evin Industries Ltd. Outerwear. 4,103,361, Cl. 2-97.000.

Carmichael, William Earl. Tree harvesting blade. 4,103,723, Cl. 144-34.00E.

Carolina Enterprises, Inc.: *See*—
Brooks, Bertram; and Speed, Eugene, 4,103,921, Cl. 280-267.000.

Carreras Rothmans, Limited: *See*—
Prouse, Ronald Ernest; West, Anthony Alfred; King, Derek Anthony; and Poulson, Roger, 4,104,115, Cl. 162-100.000.
Carroll, Robert B. Process for the presumptive identification of narcotics and drugs of abuse. 4,104,027, Cl. 23-230.00B.
Carter, Herbert F., to Connecticut International Corporation. Airport light fixture. 4,104,711, Cl. 362-153.000.
Carter, Walter H.; Christopher, Charles A.; and Jefferson, Thomas, to Texaco Inc. Imparting superior viscosity to aqueous polysaccharide solutions. 4,104,193, Cl. 252-316.000.
Caruso, Gerard P., to Shell Oil Company. Grease compositions. 4,104,177, Cl. 252-51.50A.
Cary, Francis H. Control valve. 4,103,696, Cl. 137-14.000.
Cashman, Patrick Michael, to Sykes Construction Services Limited. Production of artificial islands. 4,103,502, Cl. 61-86.000.
Caterpillar Tractor Co.: *See*—
Butterfield, Max E.; and Molnar, John, 4,103,968, Cl. 297-219.000.
Caldwell, Samuel I., 4,103,564, Cl. 74-650.000.
Kohler, Ramon C., 4,103,559, Cl. 74-471.0XY.
Cefilac: *See*—
Berard, Michel; and Lecoustey, Andre, 4,103,568, Cl. 74-801.000.
Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie: *See*—
Josis, Christian Rubens, 4,104,038, Cl. 55-19.000.
Cerf, Donald B.; and Dreibus, Perry J. Rumble seat. 4,103,961, Cl. 296-63.000.
Ceskoslovenska akademie ved: *See*—
Vozka, Stanislav; Spacek, Pavel; and Kubin, Miroslav, 4,104,363, Cl. 423-338.000.
Champion International Corporation: *See*—
Vincent, David N.; and Chang, Cheng-Hsiung, 4,104,437, Cl. 428-307.000.
Chan, Kingsley; Patel, Mahendra K.; and Wolkin, Sidney, to Lightolier Incorporated. Heat dissipating lighting fixture mount. 4,104,713, Cl. 362-294.000.
Chaney, John F.: *See*—
Donahue, Thomas H.; and Chaney, John F., 4,104,633, Cl. 343-7.00A.
Chang, Cheng-Hsiung: *See*—
Vincent, David N.; and Chang, Cheng-Hsiung, 4,104,437, Cl. 428-307.000.
Chang, David T. L., to Recortec, Inc. Video recorder/reproducer transport having two movable tension guides for controlling tape tension. 4,104,685, Cl. 360-84.000.
Chang, Louis H.: *See*—
Ruble, Frank D.; Chang, Louis H.; and Fravel, John C., 4,103,766, Cl. 197-62.000.
Chang, Wen-Hsuan; Schimmel, Karl F.; and Claar, James A., to PPG Industries, Inc. Two-package polymeric compositions. 4,104,230, Cl. 260-29.6NR.
Chanton, Edmond, to Societe Generale de Mecanique et de Metallurgie. Screw pump stators. 4,104,009, Cl. 418-48.000.
Chao, Tai S.; and Owston, Ernest H., Jr., to Atlantic Richfield Company. Iron-containing motor fuel compositions and method for using same. 4,104,036, Cl. 44-56.000.
Chaput, Stanley H., to Raymond Lee Organization, Inc., The, a part interest. Vehicle headlight alarm. 4,104,613, Cl. 340-52.00D.
Charles & Stella Guttman Breast Diagnostic Institute: *See*—
Strax, Norman, 4,104,528, Cl. 250-451.000.
Charnley, Ralph L.; and Kumpula, Clyde A., to Pako Corporation. Automatic replenisher control. 4,104,670, Cl. 354-324.000.
Chasek, Norman E. Vehicle identification system, using microwaves. 4,104,630, Cl. 343-6.50R.
Chelton, Robert G. Device for treating waste water. 4,104,164, Cl. 210-136.000.
Chemische Fabrik Dr. Wiedeking: *See*—
Ohm, Klaus, 4,104,235, Cl. 260-33.20R.
Chemische Werke Huls, AG: *See*—
Magosch, Karl-Heinz; Feinauer, Roland; and Ruter, Jorn, 4,104,261, Cl. 260-873.000.
Cheng, Jiin Duey, to Du Pont de Nemours, E. I., and Company. Substituted bromo- or chloro-acetamide herbicides. 4,104,051, Cl. 71-92.000.
Chenot, Louis A., to Mid-Equipment, Inc. Trash compactor. 4,103,608, Cl. 100-53.000.
Chenoweth, Terrence E.; and Yeoman, Frederick A., to Westinghouse Electric Corp. Silica-alumina trihydrate filled epoxy castings resistant to arced SF_6. 4,104,238. Cl. 260-37.0EP.
Chesapeake and Ohio Railway Company, The: *See*—
Spatig, Thomas G., 4,103,817, Cl. 228-173.00C.
Chevron Research Company: *See*—
Lavigne, Joe B., 4,104,477, Cl. 560-122.000.
Woo, Gar Lok; and House, Ralph, 4,104,023, Cl. 8-137.000.
Chiang, Mutong T.; and Gibbons, John P., to CPC International Inc. Starch replacement for latex polymer. 4,104,213, Cl. 260-17.300.
Chibana, Masanobu, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,103,582, Cl. 84-1.240.
Chida, Atushi: *See*—
Ueno, Zene; Morita, Akira; and Chida, Atushi, 4,103,653, Cl. 123-117.00R.
Chikao Kawada: *See*—
Kawada, Chikao; and Tsuchikura, Toshio, 4,103,451, Cl. 46-22.000.
Chipman, Arthur H. Tigner, to Shell Oil Company. Method for detecting leaks in heat exchangers. 4,103,536, Cl. 73-40.000.
Chiu, Herman Shin-Gee, to Union Carbide Corporation. Substantially neutralized aqueous liquid smoke compositions. 4,104,408, Cl. 426-135.000.
Chiyoda Chemical Engineering & Construction Co., Ltd.: *See*—
Arita, Hidemasa; Tomiyama, Hitoshi; and Mori, Shigeyasu, 4,104,041, Cl. 55-90.000.
Chlorine Engineers Corp.: *See*—
Kuri, Setuya; and Fuwa, Sinji, 4,104,039, Cl. 55-23.000.
Choi, Ye-Chin: *See*—
Srinivasan, Vadake R.; and Choi, Ye-Chin, 4,104,124, Cl. 195-33.000.
Chou, Kechia J.; and Hellmuth, Walter W., to Texaco Inc. Lubricating oil composition. 4,104,182, Cl. 252-51.50A.
Christensen, Kenneth Kaae, to Koppers Company, Inc. Apparatus for urging web guides toward the corrugating roll of a single facer. 4,104,107, Cl. 156-473.000.
Christman, William J., to UOP Inc. Mercaptan extraction process utilizing a stripped alkaline solution. 4,104,155, Cl. 208-235.000.
Christopher, Charles A.: *See*—
Carter, Walter H.; Christopher, Charles A.; and Jefferson, Thomas, 4,104,193, Cl. 252-316.000.
Chromalloy American Corporation: *See*—
Kampman, Lester R.; Ulrich, James K.; and Hodgson, James H., 4,103,475, Cl. 56-16.400.
Chu, Daniel Tim-Wo: *See*—
Bernstein, Edith; Chu, Daniel Tim-Wo; and Huckin, Stuart Nicholas, 4,104,306, Cl. 260-571.000.
Chu, Joseph Y.; and Schank, Richard L., to Xerox Corporation. Elastomers and improved waterless lithographic printing masters. 4,103,616, Cl. 101-467.000.
Chu, Simon Long: *See*—
Golda, Eugene; Wilkes, Alan Leonard; and Chu, Simon Long, 4,104,072, Cl. 96-68.000.
Chu, Wesley W.; and Korff, Phillip B., to United States of America, Navy. Multi-access memory module for data processing systems. 4,104,719, Cl. 364-200.000.
Chuchin, Alexandr Evgenievich; and Proskurin, Leonid Leonidovich. Method for protection vinyl polymers from thermo-oxidative destruction. 4,104,244, Cl. 260-45.70R.
Chugunov, Viktor Dmitrievich: *See*—
Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and Deeva, Alexandra Ivanovna, administratrix, 4,103,745, Cl. 173-57.000.
Churgin, Walter G.: *See*—
Benjamin, Adrian; Churgin, Walter G.; Biermann, Frederick; Benjamin, David W.; Cordell, Finton P.; Tempkin, Robert M.; Zambrano, Carl A.; and Halasz, Peter, 4,103,424, Cl. 32-32.000.
Ciba-Geigy AG: *See*—
Smith, Norman Alfred; and Kitzing, Rainer, 4,104,302, Cl. 260-561.00S.
Ciba-Geigy Corporation: *See*—
Buxbaum, Lothar; Kainmuller, Thomas; and Habermeier, Jurgen, 4,104,297, Cl. 528-289.000.
Huebner, Charles Ferdinand, 4,104,396, Cl. 424-267.000.
Langley, Robert, 4,104,277, Cl. 260-314.500.
Miles, Peter; Hargreaves, James Roger; and Burrows, John, 4,104,423, Cl. 427-402.000.
Nelson, Robert C.; Gannon, John Allister; and Shen, Kwan Ting, 4,104,224, Cl. 260-29.40R.
Oswald, Alexis A.; and Valint, Paul L., 4,104,378, Cl. 424-225.000.
Wegmuller, Hans; and Haase, Jaroslav, 4,104,160, Cl. 210-36.000.
Cise, Michael D., to Eli Lilly and Company. Method of preparing stable sterile ampoules of crystalline cephalosporins for parenteral administration. 4,104,391, Cl. 424-246.000.
Cise, Michael D.; and Osborne, Harold E., to Eli Lilly and Company. Crystallization process for cefazolin sodium. 4,104,470, Cl. 544-27.000.

Citizen Watch Company Limited: *See*—
Taniguchi, Tadashi; Miyaoka, Takeshi; Hagino, Daiji; Matsumoto, Ken-ichi; Sakamoto, Kazuo; Matsuda, Akira; and Shishido, Toshio, 4,103,776, Cl. 209-73.000.

CKD Praha, oborovy podnik: *See*—
Kovar, Jiri; Kafunek, Pavel; Reichel, Pavel; Pokorny, Oldrich; Pellant, Michal; Kratina, Jindrich; and Zuna, Jaroslav, 4,104,677, Cl. 357-81.000.

Claar, James A.: *See*—
Chang, Wen-Hsuan; Schimmel, Karl F.; and Claar, James A., 4,104,230, Cl. 260-29.6NR.

Clairol, Inc.: *See*—
Burian, Paul D.; and Sempliner, Arthur T., 4,103,694, Cl. 132-73.600.

Clampitt, Bert H., to Gulf Oil Corporation. Copolymers containing an alpha-olefin and an alpha, beta-ethylenically unsaturated carboxylic acid plasticized with long-chain fatty acid. 4,104,216, Cl. 260-23.0AR.

Clark, Gilbert A., to William Kenyon & Sons, Inc. Seam webbing. 4,103,717, Cl. 139-383.00A.

Clarke, James Albert, to Dow Chemical Company, The. Process for preparing high molecular weight polyether resins from bisphenols and epoxy resins. 4,104,257, Cl. 528-102.000.

Clean Energy Corporation: *See*—
Cramer, Frank B., 4,104,056, Cl. 75-33.000.

Clecon Incorporated: *See*—
Gregory, Raymond A.; and Wilcox, DeWitt Gifford, 4,104,097, Cl. 156-143.000.

Clem, Arthur G., to American Colloid Company. Method of forming a water barrier around foundations. 4,103,499, Cl. 61-50.000.

Clifft, Dale L.; and Green, Melvin G., to Melvin G. Green, Inc., a part interest. Tool for blowing insulation into an existing wall structure. 4,103,464, Cl. 52-127.000.

Cochran, John M., Jr., to Frontier Electronics, Inc. Grid wire support. 4,104,696, Cl. 361-229.000.

Cohen, David A.; and Lien, Charles, to Venus Scientific Inc. High switching speed high voltage power supply. 4,104,564, Cl. 315-171.000.

Cohen, Sasson; and Fisher, Abraham, to Purdue Frederick Company, The. Spiro (1,3-dioxolane-4,3') quinuclidine compounds. 4,104,397, Cl. 424-267.000.

Colamussi, Arturo; and Merli, Vittorio, to Pirelli Furlanis - Applicazioni Idrauliche Agricole Gomma S.p.A. Collapsible and expansible barrage. 4,103,496, Cl. 61-27.000.

Colamussi, Arturo; and Merli, Vittorio, to Pirelli Furlanis - Applicazioni Idrauliche Agricole Gomma S.p.A. Manoeuvrable weir. 4,103,497, Cl. 61-27.000.

Colato, Albert E.; and Formo, Jerome L., to Anchor Hocking Corporation. Apparatus for heating a food item while retaining its moisture and nutritional components. 4,103,736, Cl. 165-48.00R.

Colclough, Terence, to Exxon Research & Engineering Co. Lubricating and petroleum fuel oil compositions containing azole polysulfide wear inhibitors. 4,104,179, Cl. 252-32.70E.

Cole, Edward L.; Hess, Howard V.; and Guptill, Frank E., Jr., to Texaco Inc. Preparation of solid fuel-water slurries. 4,104,035, Cl. 44-51.000.

Cole, Ernest R., Jr., to United States of America, Interior. Method for eliminating solution-level attack on cathodes during electrolysis. 4,104,132, Cl. 204-12.000.

Coles, Donald Kennedy. Internal combustion engine. 4,103,655, Cl. 123-119.00B.

Colledge, Gary C. Branded wood based composition board product. 4,104,429, Cl. 428-151.000.

Collins, Cecil A.: *See*—
Fisher, Robert C.; and Collins, Cecil A., 4,103,933, Cl. 280-744.000.

Collins, Frederick H., to Valcour Imprinted Papers, Inc. Method for making packaging particles and resulting product. 4,104,440, Cl. 428-402.000.

Colt Industries Operating Corp.: *See*—
Garside, Arthur F.; and Avery, Dudley D., 4,103,652, Cl. 123-103.00R.

Columbia Industries, Inc.: *See*—
Morgan, Wesley W.; and Davis, Frank E., 4,104,352, Cl. 264-250.000.

Combe Incorporated: *See*—
Lapidus, Herbert; and Shansky, Albert, 4,104,021, Cl. 8-10.200.

Combustion Engineering, Inc.: *See*—
Grubelich, Francis Thomas, 4,104,120, Cl. 176-50.000.

Comitato Nazionale per l'Energia Nucleare-CNEN: *See*—
De Blasiis, Mario; Moccaldi, Antonio; Rori, Attilio; and Tagliati, Silvano, 4,103,553, Cl. 73-425.000.

Comm/Scope Company: *See*—
Wilkenloh, Frederic Nash; Wilson, Paul Alan; and Fox, Steve Allen, 4,104,481, Cl. 174-28.000.

Commissariat a l'Energie Atomique: *See*—
Lansiart, Alain; Gaucher, Jean-Claude; Lequais, Jean; Moretti, Jean-Luc; and Quettier, Annick, 4,103,677, Cl. 128-2.00V.

Commonwealth of Australia, The: *See*—
Gillard, Paul O.; and Whiting, Kenneth B., 4,104,634, Cl. 343-18.00C.

Communications Satellite Corp.: *See*—
Jacobus, Nelson Mortimer, Jr., 4,104,597, Cl. 330-43.000.

Compagnie Francaise des Petroles, Societe Anonyme: *See*—
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,103,500, Cl. 61-69.00R.

Compagnie Generale des Etablissements Michelin: *See*—
deZarauz, Yves, 4,104,265, Cl. 528-46.000.

Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines (DORIS) Societe Anonyme: *See*—
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,103,500, Cl. 61-69.00R.

Compagnie Honeywell Bull (Societe Anonyme): *See*—
Poublan, Alain; Bachman, Charles; and Bouvard, Jacques, 4,104,718, Cl. 364-200.000.

Compagnie Maritime d'Expertises, Societe Anonyme: *See*—
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,103,500, Cl. 61-69.00R.

Compur-Werk Gesellschaft mit beschrankter Haftung & Co.: *See*—
Retzer, Erich, 4,104,025, Cl. 23-230.00R.

Conbere, John P., to Imperial Chemical Industries Limited. Method of making a coating composition containing a fluorocarbon polymer resin and an aluminum containing binder. 4,104,225, Cl. 260-29.60F.

Conley, John L. Sheet gripping assembly. 4,103,401, Cl. 24-243.00K.

Conlin, Donald B.: *See*—
Bernecker, Gunther, 4,103,658, Cl. 123-133.000.

Connecticut International Corporation: *See*—
Carter, Herbert F., 4,104,711, Cl. 362-153.000.

Conner, William R., Jr., to Stahl-Urban Company. Methods of manufacturing pants. 4,103,363, Cl. 2-227.000.

Connor, David T.; Young, Patricia A.; and von Strandtmann, Maximilian, to Warner-Lambert Company. 1-Substituted-2-(2-pyridinyl)ethanone N-oxides. 4,104,274, Cl. 260-295.0AM.

Consolidated Energy Products Co.: *See*—
Johnston, Charles Richard; and MacGregor, James G., 4,103,926, Cl. 280-414.00R.

Construction Specialties, Inc.: *See*—
Olsen, Robert W., 4,103,468, Cl. 52-473.000.

Container Corporation of America: *See*—
Brandenburger, A. M.; Helms, C. R.; and Barker, D. F., 4,103,770, Cl. 206-193.000.

Continental Belton Co.: *See*—
Bylsma, Simon, 4,103,474, Cl. 56-15.900.

Continental Group, Inc., The: *See*—
Gerber, Howard L., 4,104,498, Cl. 219-10.430.

Continental Oil Company: *See*—
Weimer, Dean R.; and Durr, Albert M., 4,104,454, Cl. 526-62.000.

Continental Rubber Works: *See*—
Haytock, Benjamin, III, 4,103,713, Cl. 138-133.000.

Control Components, Inc.: *See*—
Hoof, Robert Grant, 4,103,534, Cl. 73-37.000.

Cook, Charles E. Stressed skin structural diaphragm. 4,103,470, Cl. 52-794.000.

Cooper, Kenneth R., to Canada Square Management Ltd. Wall structure. 4,103,598, Cl. 98-31.000.

Cooper, Kenneth R.: *See*—
Moog, Gerhard W.; and Cooper, Kenneth R., 4,103,706, Cl. 137-574.000.

Coran, Aubert Y.; and Patel, Raman P., to Monsanto Company. Thermoplastic compositions of high unsaturation diene rubber and polyolefin resin. 4,104,210, Cl. 260-4.00R.

Cordell, Finton P.: *See*—
Benjamin, Adrian; Churgin, Walter G.; Biermann, Frederick; Benjamin, David W.; Cordell, Finton P.; Tempkin, Robert M.; Zambrano, Carl A.; and Halasz, Peter, 4,103,424, Cl. 32-32.000.

Cordis Corporation: *See*—
Harris, Donald Leal, 4,103,690, Cl. 128-418.000.

Cornelius, Harry C., to Monsanto Company. Detecting and sorting abnormal articles during blow molding. 4,104,343, Cl. 264-40.100.

Cornellier, Joseph Rene, to Neretex Corp. Leno motion device. 4,103,716, Cl. 139-54.000.

Corse, Louis Gaston, to Machines Chambon. Cutting machines for cutting up a web of material such as paper or cardboard. 4,103,595, Cl. 93-58.300.

Cotrel, Claude: *See*—
Barreau, Michel; Cotrel, Claude; and Jeanmart, Claude, 4,104,386, Cl. 424-250.000.

Cotton, Lou S.: *See*—
Johnson, Raymond G., Jr.; Cotton, Lou S.; and Verzella, David J., 4,103,848, Cl. 244-17.130.

Coudray, Paul Amand Louis: *See*—
Duthion, Louis; Bonnet, Pierre; and Coudray, Paul Amand Louis, 4,103,702, Cl. 137-375.000.

Covey, Rupert A.; and Grahame, Robert E., Jr., to Uniroyal, Inc. Control of insects and acarids with alkynyl phenylphenol divalent aliphatic sulfites. 4,104,401, Cl. 424-303.000.

CPC International Inc.: *See*—
Bruner, Robert L., 4,104,212, Cl. 260-17.300.
Chiang, Mutong T.; and Gibbons, John P., 4,104,213, Cl. 260-17.300.
Danzig, Morris J.; and Milkovich, Ralph, 4,104,330, Cl. 260-880.00B.

Cramer, Frank B., to Clean Energy Corporation. Ore reduction using molten salts. 4,104,056, Cl. 75-33.000.

Crane Packing Co.: *See*—
Tankus, Harry, 4,103,904, Cl. 277-42.000.

Crissy, Robert J., to Powers Chemco, Inc. Method for organizing and preparing photogenerated printing media. 4,104,071, Cl. 96-41.000.

Cromer, Oscar M.: *See*—
Weigle, Wayne L.; Fogle, Edgar L.; Cromer, Oscar M.; and Schafer, Larry C., 4,104,631, Cl. 343-7.00A.

Cronauer, Donald C.; and Kehl, William L., to Gulf Research & Development Company. Hydrogenating catalyst. 4,104,200, Cl. 252-465.000.

Cronin, John A.: *See*—
Fountain, Gerald F.; Veloz, Jaime; Bilson, Edward A.; and Cronin, John A., 4,104,157, Cl. 209-166.000.

Cronin, Michael Joseph, to Lockheed Aircraft Corporation. Dual filament current limiting and status indicating circuit. 4,104,620, Cl. 340-642.000.

Crouse, Dennis N.: *See*—
Walsh, Fraser M.; Crouse, Dennis N.; and Ajami, Alfred M., 4,104,447, Cl. 429-15.000.

Cruz, Edmundo Novas; and Valadares, Alvaro Neff, to Sir James Farmer Norton & Co., Limited. Vertical rotary screen printing machine and ink supply therefore. 4,103,615, Cl. 101-120.000.

Csutor, Endre; Mittler, Leo; and Wortche, Rudolf. Arrangement for receiving contact potential responsive switching devices. 4,104,690, Cl. 361-45.000.

Cunningham, Robert E., to Goodyear Tire & Rubber Company, The. Process for the preparation of novel block polymers. 4,104,331, Cl. 260-880.00B.

Cupa Engineering Co. Ltd.: *See*—
Wignall, Norman, 4,103,630, Cl. 112-79.00R.

Curtin, Hoyt S. Pipe coupling. 4,103,943, Cl. 285-419.000.

Curtis, Glenn Howard: *See*—
Parrillo, Henry; Harrington, John Sherman; and Curtis, Glenn Howard, 4,103,403, Cl. 26-91.000.

Curtiss, John N.; Koehler, Charles E.; and Murray, Pat L., to Upjohn Company, The. Process for molding a substantially isotropic isocyanate-based polymer foam bun. 4,104,346, Cl. 264-51.000.

Cuschera, Casper. Pop up drain fitting. 4,103,372, Cl. 4-286.000.

Custer, Lloyd Roy: *See*—
Wynn, John Dee; Denton, George Terrance; Bell, Richard Judd; Vernon, Harry Rowe; and Custer, Lloyd Roy, 4,104,413, Cl. 426-582.000.

Cutler, Earl F., to Cutler Repaving, Inc. Depth control for asphalt pavement milling machine. 4,103,973, Cl. 299-39.000.

Cutler Repaving, Inc.: *See*—
Cutler, Earl F., 4,103,973, Cl. 299-39.000.

Dahle, Norman A., deceased, to Gulf Oil Corporation. 3-Benzyl-2-methylimino-5-phenyl-Δ^4-1,3,4-thiadiazolines and method of combating undesired plant growth. 4,104,053, Cl. 71-90.000.

Dai Nippon Toryo Co., Ltd.: *See*—
Hosoda, Minoru; Kasiwagi, Eiichi; Murayama, Fumio; and Isayama, Kohei, 4,104,223, Cl. 260-29.2EP.

Daigle, Milton L., to Tool Masters, Inc., a part interest. Oil well perforation testing device. 4,103,741, Cl. 166-147.000.

Dainichi-Nippon Cables, Ltd.: *See*—
Koide, Yooichi; Kaide, Tamotsu; Takada, Michio; and Ichikawa, Keiji, 4,104,073, Cl. 106-15.0FP.

Dalimonte, Alfred A.: *See*—
Saylor, Richard; Dalimonte, Alfred A.; and Nagel, Robert H., 4,104,681, Cl. 358-141.000.

Dallas, Gary S.; and Pittaro, Richard J., to Krautkramer-Branson, Incorporated. Pulse peak detector circuit. 4,104,545, Cl. 307-351.000.

Dalmau, José Ma: *See*—
Lombardi, Victor J.; and Dalmau, José Ma, 4,103,518, Cl. 66-107.000.

Daly, Edwin R.: *See*—
Faber, Paul V.; Daly, Edwin R.; and Jain, Prithvi, 4,104,128, Cl. 201-4.000.

Damico, Frank M.; and O'Toole, Patrick John, to Joerns Furniture Company, Division of American Seating Company. Patient headwall unit. 4,104,710, Cl. 362-130.000.

Daniel, Danny O. Method and apparatus for correcting bent strut misalignment. 4,103,531, Cl. 72-380.000.

Danzig, Morris J.; and Milkovich, Ralph, to CPC International Inc. Synthesis and copolymerization of tapered block macromer monomers. 4,104,330, Cl. 260-880.00B.

Data General Corporation: *See*—
Gruner, Ronald Hans, 4,104,720, Cl. 364-200.000.

Dataproducts (Santa Clara), Inc.: *See*—
Hoffman, Richard Ernest; and Bruckner, Maximiliaan, 4,103,417, Cl. 29-737.000.

Date, Masakazu; and Wada, Masahiro, to Toyo Boseki Kabushiki Kaisha. Dispersion of linear polyester resin. 4,104,222, Cl. 260-29.20E.

Davidson, Amber Charles, to Boyd, Byron W. Apparatus for ultrasonic cleaning of carpet, upholstery, and similar materials. 4,103,519, Cl. 68-3.0SS.

Davies, Thomas J., Jr., to Fairchild Camera and Instrument Corporation. Digitally synthesized back-up frequency. 4,104,538, Cl. 307-64.000.

Davis, Albert F. Utensil with grease shield. 4,103,420, Cl. 30-129.000.

Davis, Donald H., to General Electric Company. Valve operator. 4,103,592, Cl. 91-448.000.

Davis, Frank E.: *See*—
Morgan, Wesley W.; and Davis, Frank E., 4,104,352, Cl. 264-250.000.

Davis, Phillip K.; Leaver, Helen S.; and Freiser, Henry, to Amax Inc. Regeneration of organic extractants containing α-hydroxyoximes. 4,104,359, Cl. 423-139.000.

Davis, Stephen H., to Water Refining Company, Inc. Volume and time of day control for water softener regeneration. 4,104,158, Cl. 210-25.000.

Dawson International Limited: *See*—
Smith, Geoffrey Allan, 4,104,019, Cl. 8-2.000.

Day, Ronald: *See*—
Matthews, Bruce Ernest; and Day, Ronald, 4,103,419, Cl. 30-95.000.

Dayus, Lloyd Giddis. Air grille components and air grille therefrom. 4,103,601, Cl. 98-110.000.

De Laval Separator Company, The: *See*—
Graef, Myron Lee, 4,104,004, Cl. 417-313.000.

Debeir, Rene Pierre, to European Atomic Energy Community (Euratom). Sealing of controlled-atmosphere containers by magnewelding. 4,103,813, Cl. 228-2.500.

De Blasiis, Mario; Moccaldi, Antonio; Rori, Attilio; and Tagliati, Silvano, to Comitato Nazionale per l'Energia Nucleare-CNEN. Apparatus for the indirect monitoring of the radioactive contamination of surfaces. 4,103,553, Cl. 73-425.000.

De Boel, Marcel: *See*—
Nolte, Hans-Henning; De Boel, Marcel; and Baudin, Pol, 4,104,427, Cl. 428-68.000.

Debord, Daniel; and Soussan, Salomon, to Rhone-Progil. Bulk polymerization of vinyl chloride to control grain size. 4,104,457, Cl. 526-203.000.

Deere & Company: *See*—
Fletcher, Edward Horton; and Wiegardt, Gordon K., 4,103,489, Cl. 60-395.000.

Deev, Pavel Ivanovich, deceased: *See*—
Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and Deeva, Alexandra Ivanovna, administratrix, 4,103,745, Cl. 173-57.000.

Deeva, Alexandra Ivanovna, administratrix: *See*—
Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and Deeva, Alexandra Ivanovna, administratrix, 4,103,745, Cl. 173-57.000.

Deguchi, Masahiro: *See*—
Wakami, Noboru; and Deguchi, Masahiro, 4,104,684, Cl. 360-70.000.

Deinert, J. Clifford; Taylor, Charles E.; and Mumford, Harry W., to Sandvik, Inc. Reel. 4,103,844, Cl. 242-107.000.

Delalande S.A.: *See*—
Fauran, Claude P.; Turin, Michel J.; Imbert, Thierry F.; Raynaud, Guy M.; and Dorme, Nicole A. M., 4,104,384, Cl. 424-248.510.

Delaney, John H. Ventilation stop for windows. 4,103,947, Cl. 292-194.000.

del Rio, Marija; Behnke, Joachim; Wallrabenstein, Michael; and Frank, Dieter, to Akzona Incorporated. Metal complex compounds of polyacyl-2,4-dihydrazino-5-triazines. 4,104,258, Cl. 528-334.000.

Demarcq, Michel: *See—*
Sleziona, Joseph; and Demarcq, Michel, 4,104,309, Cl. 260-606.50P.

De Matteo, John J.: *See—*
Melling, Norman D.; De Matteo, John J.; Levrant, Melvyn A.; and Juels, Ronald J., 4,104,608, Cl. 340-3.0PS.

Demyon, Thomas R. Sight gauge device for flexible liquid carriers. 4,103,641, Cl. 116-117.00C.

Deneke, Wayne A.: *See—*
Rahman, Abdul R.; and Deneke, Wayne A., 4,104,414, Cl. 426-599.000.

Denisart, Jean-Paul; Edney, Barry E.; and Young, Chapman, to Atlas Copco Aktiebolag. Method for breaking rock by directing high velocity jet into pre-drilled bore. 4,103,971, Cl. 299-17.000.

Dennis, Bruce E.: *See—*
Latta, Bruce M.; Stevens, Catherine V.; and Dennis, Bruce E., 4,104,443, Cl. 428-474.000.

Denton, George Terrance: *See—*
Wynn, John Dee; Denton, George Terrance; Bell, Richard Judd; Vernon, Harry Rowe; and Custer, Lloyd Roy, 4,104,413, Cl. 426-582.000.

Dermy, Rene M.: *See—*
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,103,500, Cl. 61-69.00R.

Deryagin, Boris Vladimirovich: *See—*
Fedoseev, Dmitry Valerianovich; Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; Varnin, Valentin Pavlovich; Vnukov, Stanislav Pavlovich; Gerasimenko, Valentin Korneevich; Nikitin, Jury Ivanovich; Tsypin, Nekhemyan Veniaminovich; and Hochko, Anatoly Vasilievich, 4,104,441, Cl. 428-408.000.

Design & Manufacturing Corporation: *See—*
Tisone, Thomas C.; Krueger, Helmut H. A.; Sobecks, Ronald S.; and Tauber, Richard N., 4,104,507, Cl. 219-513.000.

Desmond, John W.; Kmec, Joseph F.; and Meyer, Charles A., to Westinghouse Electric Corp. Variable radius springback wavy seal. 4,103,905, Cl. 277-56.000.

Desormiere, Bernard; and Spitz, Erich, to Thomson-CSF. Electrically controlled optical switch. 4,103,988, Cl. 350-162.00R.

DeSoto, Inc.: *See—*
Anders, Dale F.; Brizgys, Peter V.; Mattiuz, Ronald; and Murphy, Edward J., 4,104,100, Cl. 204-181.00R.
Sekmakas, Kazys; and Hesler, Kenneth K., 4,104,229, Cl. 260-29.6RW.

Deuterium Corporation: *See—*
Spevack, Jerome S., 4,104,032, Cl. 23-270.50W.

Deutsch, Joseph Paul; and Jones, Ray A. Tilt-up panel bracket. 4,104,356, Cl. 264-297.000.

Deutsch, Ralph, to Kawaii Musical Instrument Mfg. Co. Constant speed portamento. 4,103,581, Cl. 84-1.240.

Deutsche Gold- und Silber-Scheideanstalt vormals Koessler: *See—*
Junkermann, Helmut; and Schwab, Heinrich, 4,104,162, Cl. 210-63.00R.

DeVitis, James L. Oil dip stick wiper. 4,103,388, Cl. 15-210.00B.

Dewald, James R.; and Markley, Lowell D., to Dow Chemical Company, The. Process for separating an ar, ar-dihalo-ar-alkylbenzene from an isomeric mixture of ar, ar-dihalo-ar-alkylbenzenes. 4,104,315, Cl. 260-650.00R.

de Wied, David: *See—*
Greven, Hendrik Marie; and de Wied, David, 4,104,371, Cl. 424-177.000.

DeWitt, Robert R., to Lutron Electronics Co., Inc. Dimmer switch with insulation housing. 4,104,606, Cl. 338-198.000.

deZarauz, Yves, to Compagnie Generale des Etablissements Michelin. Vulcanization process for preparation of polyurethane tires. 4,104,265, Cl. 528-46.000.

Diagnostic Information Inc.: *See—*
Wang, Shih-Ping; Robbins, Charles D.; and Merritt, Elisha, 4,104,516, Cl. 250-213.0VT.

Diamond Shamrock Corporation: *See—*
Brannan, James R.; Malkin, Irving; and Brown, Claude M., 4,104,133, Cl. 204-25.000.

Dickens, Lawrence E., to Westinghouse Electric Corp. Field effect pentode transistor. 4,104,673, Cl. 357-22.000.

DiCola, Joseph A., to Traffic Systems, Inc. Traffic light dimmer system. 4,104,562, Cl. 315-158.000.

Didycz, William J.; Glassman, Donald; Maier, Edward E.; and Saniga, George T., to United States Steel Corporation. Process for separating ammonia and acid gases from waste waters containing fixed ammonia salts. 4,104,131, Cl. 203-7.000.

Diehl: *See—*
Steinborn, Wilhelm; and Mechenbier, Alois, 4,103,498, Cl. 61-45.00B.

Diesel Kiki Co. Ltd.: *See—*
Shibuya, Tsunenori, 4,104,010, Cl. 418-76.000.

Dieterich, Frank L.; and Abrams, Stanton. Vegetable drying apparatus. 4,103,432, Cl. 34-58.000.

Dietrich, Hans, to Losinger AG. Means for extracting a soil anchor consisting of a prestressed steel tendon. 4,103,618, Cl. 102-22.00R.

Dillard, Lawrence. Karate combat shoe. 4,103,437, Cl. 36-2.00R.

DiLorenzo, James Vincent; Mahoney, Gerard Edward; and Moran, Joseph Michael, to Bell Telephone Laboratories, Incorporated. High power gallium arsenide schottky barrier field effect transistor. 4,104,672, Cl. 357-22.000.

Dima, Attila F.: *See—*
Bahder, George; Eager, George S., Jr.; Dima, Attila F.; and Walker, James J., 4,104,479, Cl. 174-22.00R.

DiMaria, Donelli J.; and Young, Donald R., to International Business Machines Corporation. Moderate field hole and electron injection from one interface of MIM or MIS structures. 4,104,675, Cl. 357-54.000.

Dinwiddie, Curt, to Lubrication Engineers, Inc. Impact grease tester. 4,103,533, Cl. 73-12.000.

Di Piazza, Learco; and Migoni, Angelo, to European Atomic Energy Community (Euratom). Method of electroerosion and an apparatus for producing cavities inside a solid metal component. 4,104,503, Cl. 219-69.00E.

Di Pilato, Nino Mario: *See—*
Aichelmann, Frederick John, Jr.; Di Pilato, Nino Mario; Fehn, Thomas Peter; and Rudy, George John, 4,103,823, Cl. 235-312.000.

Ditcher, John, to A-Lok Corporation. Molded pleated gasket and device for installing same on pipe. 4,103,901, Cl. 277-9.500.

Dix, James Allen; Guettel, Marvin A.; and Aslin, Michael, to Square D Company. Digital welder control system. 4,104,724, Cl. 364-477.000.

Dixilyn International, Inc.: *See—*
Smith, Marvin L., 4,103,503, Cl. 61-97.000.

Dixon, Dale D.; Ford, Michael E.; and Mantell, Gerald J., to Air Products & Chemicals, Inc. End capped polyalkylene carbonates having improved thermal stablity. 4,104,264, Cl. 528-370.000.

Dixon, Guy E., to Panelfold Doors, Inc. Portable wall system. 4,103,463, Cl. 52-122.000.

Dmitriev, Alexei Pavlovich: *See—*
Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and Deeva, Alexandra Ivanovna, administratrix, 4,103,745, Cl. 173-57.000.

Dobo, Emerick J., to Monsanto Company. Method for making steel wire. 4,104,445, Cl. 428-567.000.

Dr. Beck & Co., AG: *See—*
Janssen, Harald; and Hansch, Ferdinand, 4,104,221, Cl. 260-29.20N.

Domination Incorporated: *See—*
McCraw, Dan, 4,103,894, Cl. 273-126.00A.

Donahue, Charles R.; and Terlecki, Leo, to GF Business Equipment, Inc. Removable furniture panel. 4,103,981, Cl. 312-257.00A.

Donahue, Thomas H.; and Chaney, John F., to International Telephone and Telegraph Corporation. Extended target-log CFAR processor. 4,104,633, Cl. 343-7.00A.

Donigian, Donald S. Ignition system. 4,103,659, Cl. 123-148.0DC.

Doran, Wayne M.: *See—*
O'Brien, William L.; and Doran, Wayne M., 4,103,617, Cl. 101-93.030.

Dorling, Rolf; and Westebbe, Klaus, to L. & C. Steinmuller GmbH. Apparatus for drying wet steam and subsequently superheating the dried steam. 4,103,647, Cl. 122-483.000.

Dorman, William J.: *See—*
Morrison, Steven; and Dorman, William J., 4,104,730, Cl. 364-815.000.

Dorme, Nicole A. M.: *See—*
Fauran, Claude P.; Turin, Michel J.; Imbert, Thierry F.; Raynaud, Guy M.; and Dorme, Nicole A. M., 4,104,384, Cl. 424-248.510.

Dorsch, Hans-Lothar; and Raue, Roderich, to Bayer Aktiengesellschaft. Cationic diazacyanine dyestuffs. 4,104,268, Cl. 260-158.000.

Doryokuro Kakunenryo Kaihatsu Jigyodan: *See—*
Taniguchi, Tadashi; Miyaoka, Takeshi; Hagino, Daiji; Matsumoto, Ken-ichi; Sakamoto, Kazuo; Matsuda, Akira; and Shishido, Toshio, 4,103,776, Cl. 209-73.000.

Doss, Richard C., to Phillips Petroleum Company. Process for encapsulating objects and for forming flexible molds. 4,104,350, Cl. 264-225.000.

Douglas, Anthony Frederick: *See—*
Keene, David Edward; and Douglas, Anthony Frederick, 4,104,211, Cl. 260-8.000.

Douglas, Lawrence M., to Polaroid Corporation. Photographic apparatus having a spring driven motor. 4,104,659, Cl. 354-170.000.

Dover Corporation: *See—*
Lasater, Donald A.; and Ebbesmeyer, Steven R., 4,103,938, Cl. 285-136.000.

Dow Chemical Company, The: *See—*
Clarke, James Albert, 4,104,257, Cl. 528-102.000.
Dewald, James R.; and Markley, Lowell D., 4,104,315, Cl. 260-650.00R.
Hickner, Richard A., 4,104,283, Cl. 260-348.430.
Jones, Giffin D., 4,104,289, Cl. 260-42.410.
May, James A., Jr.; and Bressler, Wilbur L., 4,104,198, Cl. 252-429.00B.
Meyer, Victor E.; and Kem, Kenneth M., 4,104,228, Cl. 260-29.6NR.

Dow Corning Corporation: *See—*
Blizzard, John D.; and Monroe, Carl M., 4,104,351, Cl. 264-236.000.
Brooks, William T.; and Vincent, Gary A., 4,104,184, Cl. 252-63.700.
Klosowski, Jerome M.; and Romig, Charles A., 4,104,295, Cl. 260-448.20N.

Dowd, Daniel J., to Westvaco Corporation. Stretchable material rewinding machine. 4,103,840, Cl. 242-67.30R.

Draftex Development AG: *See—*
Barnerias, Jean; Johnson, Anthony E.; and Weimar, Erich, 4,103,459, Cl. 49-491.000.

Dreibus, Perry J.: *See—*
Cerf, Donald B.; and Dreibus, Perry J., 4,103,961, Cl. 296-63.000.

Drew Chemical Corporation: *See—*
Mahn, Frederick; Breindel, Kenneth; Scanley, Clyde; and Sexsmith, David, 4,104,033, Cl. 23-300.000.

Dridze, Lev Samuilovich: *See—*
Zdanovsky, Mikhail Romanovich; Minashin, Viktor Vasilievich; Nikolaev, Vladimir Yakovlevich; Razuvaev, Viktor Alexandrovich; Perelygin, Ivan Petrovich; Mikhaevich, Stanislav Leonidovich; and Dridze, Lev Samuilovich, 4,103,915, Cl. 279-119.000.

Duble, Gerald R., to Gould Inc. Latch means for switch enclosure. 4,104,491, Cl. 200-50.00A.

Duc, Nguyen-Cong; Brehant, Jean-Louis Marie; Pons, Benoit-Joseph; and Sechet, Maurice Henri, to Les Produits Organiques du Santerre Orsan. Process of producing a "xanthemonas-type" polysaccharide. 4,104,123, Cl. 195-31.00P.

Ducret, Lucien C. Cable armor cutting machine. 4,103,578, Cl. 83-409.000.

Dudley, Michael A.: *See—*
Parthasarathy, Mellapalayam R.; Nethersole, Douglas C.; and Dudley, Michael A., 4,104,416, Cl. 427-29.000.

Duisburger Kupferhutte: *See—*
Lippert, Karl; and Planken, Heinz, 4,104,055, Cl. 75-1.00R.

Duncan, Gary W.: *See—*
Broering, Leo H.; and Duncan, Gary W., 4,104,453, Cl. 526-10.000.

Dunlop, Andrew P., to Quaker Oats Company, The. Apparatus and process for catalytic gassing in the manufacture of foundry cores and molds, and the like. 4,103,729, Cl. 164-12.000.

Dunn, Stanley A.; and Paquette, Elmer G., to Bjorksten Research Laboratories, Inc. Vitreous fiber drawing process. 4,104,355, Cl. 264-290.00R.

Du Pont de Nemours, E. I., and Company: *See—*
Angelo, Rudolph John; Blomberg, Richard Nelson; Boettcher, Fritz Peter; Ikeda, Richard Masayoshi; and Samuels, Michael Robert, 4,104,438, Cl. 428-332.000.
Cheng, Jiin Duey, 4,104,051, Cl. 71-92.000.
Howard, Edward G., Jr., 4,104,243, Cl. 260-42.140.
Kauer, James Charles, 4,104,275, Cl. 260-297.00B.

Dura Corporation: *See—*
Hansen, Clarence M.; Harvey, John P.; and Ledebuhr, Richard L., 4,103,607, Cl. 99-548.000.

Duraflame, Inc.: *See—*
Wu, Kent Yengtsu; and Barron, Roger S., 4,104,034, Cl. 44-10.00R.

Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, to Smith Kline & French Laboratories Limited. Pharmacologically active compounds. 4,104,381, Cl. 424-246.000.

Durden, John A., Jr.; Sousa, Anthony A.; and Stephen, John F., to Union Carbide Corporation. Esters of 3-hydroxyindone compounds as herbicides and miticides. 4,104,043, Cl. 71-107.000.

Durr, Albert M.: *See—*
Weimer, Dean R.; and Durr, Albert M., 4,104,454, Cl. 526-62.000.

Dussart, Bernard Emile Andre, to Union Siderurgique du Nord et de l'Est de la France. Process for electromagnetic stirring. 4,103,730, Cl. 164-49.000.

Duthion, Louis; Bonnet, Pierre; and Coudray, Paul Amand Louis, to Bertin & Cie. Sound proofed valve for fluid under pressure. 4,103,702, Cl. 137-375.000.

Dutra, Gerard A., to Monsanto Company. Acetimidic (α-diaryloxyphosphinylmethylamino) acid ester hydrochlorides, herbicidal composition and herbicidal use thereof. 4,104,050, Cl. 71-86.000.

Dworkin, Robert D.; and Ejk, Adam J., to M&T Chemicals Inc. Method for preparing organotin compounds. 4,104,292, Cl. 260-429.700.

Dyckerhoff & Widmann Aktiengesellschaft: *See—*
Buchler, Wilhelm; Muller, Gotthard; and Mende, Hans-Joachim, 4,103,861, Cl. 249-20.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Schade, Gerhard, 4,104,262, Cl. 528-295.000.
Zoche, Gunter; Richtzenhain, Hermann; and Vogt, Wilhelm, 4,104,300, Cl. 260-544.00D.

Dynapol: *See—*
Zaffaroni, Alejandro, 4,104,196, Cl. 252-404.000.

E M I Limited: *See—*
Pearce, Ralph Reginald, 4,104,513, Cl. 235-450.000.

E. R. Squibb & Sons, Inc.: *See—*
Sprague, Peter W.; and Heikes, James E., 4,104,467, Cl. 542-442.000.
Wade, Peter C.; and Kissick, Thomas P., 4,104,387, Cl. 424-250.000.
Wade, Peter C.; and Kissick, Thomas P., 4,104,388, Cl. 424-250.000.
Weisenborn, Frank Lee; Haugwitz, Rudiger D.; and Hauck, Frederic Peter, 4,104,400, Cl. 424-270.000.

E-Systems, Inc.: *See—*
Nielson, David R., 4,104,637, Cl. 343-106.00R.

Eager, George S., Jr.: *See—*
Bahder, George; Eager, George S., Jr.; Dima, Attila F.; and Walker, James J., 4,104,479, Cl. 174-22.00R.

Eagon, Beverly M.; Carlson, Russell L.; and Fry, Raymond C., to Morgan Adhesives Company. Method of making a retroreflective laminate. 4,104,102, Cl. 156-298.000.

Eastman Kodak Company: *See—*
Fox, Richard Samuel, 4,103,885, Cl. 271-117.000.
Frank, Lee Fitzpatrick; and Lee, James Kelly, 4,104,657, Cl. 354-50.000.
Fuzek, John Frank, 4,104,439, Cl. 428-397.000.
Granger, Edward Maurice, 4,104,683, Cl. 360-9.000.

Eaton Corporation: *See—*
Jones, William H.; and Astrom, Gordon L., 4,104,495, Cl. 200-83.00P.
Pecsi, Louis E., 4,104,688, Cl. 361-28.000.
Rayment, Larry W.; and Kilbourn, Thomas S., 4,104,505, Cl. 219-76.160.
Richards, Donald L., 4,103,704, Cl. 137-522.000.
Tinholt, Thomas H., 4,103,765, Cl. 192-58.00B.
Van Niel, Clarence R., 4,104,622, Cl. 340-572.000.

Ebbesmeyer, Steven R.: *See—*
Lasater, Donald A.; and Ebbesmeyer, Steven R., 4,103,938, Cl. 285-136.000.

Ebert, Edward A. Support for deformable articles and method of making the same. 4,104,508, Cl. 219-521.000.

Eco-Control, Inc.: *See—*
Walsh, Fraser M.; Crouse, Dennis N.; and Ajami, Alfred M., 4,104,447, Cl. 429-15.000.

Edgar Pickering (Blackburn) Limited: *See—*
Sedlaczek, Richard, 4,103,635, Cl. 112-266.000.

Edney, Barry E.: *See—*
Denisart, Jean-Paul; Edney, Barry E.; and Young, Chapman, 4,103,971, Cl. 299-17.000.

Edwards, Albert, to Baker Perkins Holdings Limited. Manufacture of foundry cores and moulds. 4,103,733, Cl. 164-160.000.

Edwards, John. Method and apparatus for sterilization. 4,103,688, Cl. 128-303.170.

Edwards, Robert W.: *See—*
Bean, Lawrence M.; Edwards, Robert W.; and Wright, Theodore, 4,104,617, Cl. 340-147.00R.

Ehlers, Albert: *See—*
Scholz, Erwin; and Ehlers, Albert, 4,104,667, Cl. 354-250.000.

Ehrich, Frederic Franklin, to General Electric Company. Spiral strip acoustic treatment. 4,104,002, Cl. 415-119.000.

Ehrlich, Norman A. Offshore platform for ice-covered waters. 4,103,504, Cl. 61-102.000.

Ehrlich, Shelton: *See—*
Yerushalmi, Joseph; Ehrlich, Shelton; Maaghoul, Mohammad, deceased; and Lund, Terry E., 4,103,646, Cl. 122-4.00D.

Eisenbach, Wilhelm; Lehmkuhl, Herbert; and Wilke, Gunther, to Studiengesellschaft Kohle mbH. Process for the electrochemical synthesis of organic metal compounds. 4,104,140, Cl. 204-78.000.

Eisenberg, Bernard C., to Solbern Corp. Method and apparatus for filling containers with liquid. 4,103,720, Cl. 141-1.000.

Ejk, Adam J.: *See—*
Dworkin, Robert D.; and Ejk, Adam J., 4,104,292, Cl. 260-429.700.

Eldridge, John S., Sr., to General Electric Company. Roll crimp machine. 4,103,527, Cl. 72-75.000.

Electric Machinery Manufacturing Company: *See—*
Rohner, Thomas G., 4,104,689, Cl. 361-44.000.

Electric Power Research Institute, Inc.: *See—*
Yerushalmi, Joseph; Ehrlich, Shelton; Maaghoul, Mohammad, deceased; and Lund, Terry E., 4,103,646, Cl. 122-4.00D.

Electroacustic GmbH: *See—*
Block, Dieter, 4,104,643, Cl. 346-17.000.

Electrochem, Inc.: *See—*
Bohnstedt, Werner; and Stommel, Manfred, 4,104,449, Cl. 429-110.000.

Eley, Carl W. Permanent athletic field marker. 4,103,886, Cl. 272-3.000.

Elf-Union: *See—*
Bernard, Jean Rene; and Nury, Jean, 4,104,320, Cl. 260-673.500.

Eli Lilly and Company: *See—*
Beck, James Richard, 4,104,054, Cl. 71-103.000.
Cise, Michael D., 4,104,391, Cl. 424-246.000.
Cise, Michael D.; and Osborne, Harold E., 4,104,470, Cl. 544-27.000.
Fukuda, David S.; Abbott, Bernard J.; and Archer, Robert A., 4,104,282, Cl. 260-345.300.

Elizalde, Manuel Coll; and Bacardit, Juan Simon, to Bendix Corporation, The. Manufacturing method for a high pressure distributor rotor. 4,103,407, Cl. 29-157.10R.

Elkhart Brass Manufacturing Co., Inc.: *See—*
Thompson, William S., 4,103,868, Cl. 251-283.000.

Elkhart Products Corporation: *See—*
Bills, Franklin Deloy, 4,103,940, Cl. 285-189.000.

Ellanin Investments, Ltd.: *See—*
Holland, David E., 4,104,680, Cl. 358-132.000.

Ellison, Frederick John: *See—*
Barker, Philip Edwin; Hatt, Brian William; and Ellison, Frederick John, 4,104,078, Cl. 127-46.00R.

Elmeg Elektro-Mechanik GmbH: *See—*
Reuting, Hans-Werner, 4,104,591, Cl. 324-205.000.

Elms, Robert T.: *See—*
Shimp, Alan B.; Meyer, Thomas N.; and Elms, Robert T., 4,104,691, Cl. 361-96.000.

Elsbett, Gunter: *See—*
Elsbett, Ludwig; and Elsbett, Gunter, 4,103,663, Cl. 123-188.00S.

Elsbett, Ludwig; and Elsbett, Gunter. Cylinder head for internal combustion engines, especially diesel engines. 4,103,663, Cl. 123-188.00S.

Elser, Wilhelm: *See—*
Boessler, Hanns; Elser, Wilhelm; Huebner, Klaus; and Ottofrickenstein, Hans, 4,104,227, Cl. 260-29.6HN.

Elsey, Paul G.: *See—*
Wollensak, John C.; Shin, Kju Hi; Ihrman, Kryn G.; and Elsey, Paul G., 4,104,255, Cl. 260-45.95C.

Elvin, Sten, to ASEA AB. Static converter equipment. 4,104,537, Cl. 307-58.000.

Emco Industries, Inc.: *See—*
Engman, Norman R., 4,103,965, Cl. 297-192.000.

Emerson Electric Co.: *See—*
Baysinger, Robert L., 4,104,016, Cl. 431-54.000.

Emhart Industries, Inc.: *See—*
Surko, Walter E., Jr., 4,103,526, Cl. 70-364.00A.

Emmett, John Colin: *See—*
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Endo, Hiroshi: *See—*
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Endo, Kiyonobu: *See—*
Goshima, Takeshi; Sugiura, Yoshinori; Endo, Kiyonobu; Sato, Hideaki; and Kono, Kimio, 4,104,573, Cl. 318-640.000.

Engdahl, Jean; and Matthey, Huber, to Societe Suisse pour l'Industrie Horlogere (SSIH) Management Services S.A. Fastening and suspension element for a piezoelectric resonator. 4,104,553, Cl. 310-352.000.

Engelsmann, Dieter: *See—*
Winkler, Alfred; Lermann, Peter; Engelsmann, Dieter; and Fauth, Gunter, 4,104,664, Cl. 354-213.000.

Engen, Glenn F., to United States of America, Commerce. Six-port measuring circuit. 4,104,583, Cl. 324-58.00A.

Engman, Norman R., to Emco Industries, Inc. Fishing chair. 4,103,965, Cl. 297-192.000.

Enlow, William Palmer: *See—*
Hechenbleiknер, Ingenuin; and Enlow, William Palmer, 4,104,252, Cl. 260-45.80R.

Erco Envirotech Ltd.: *See—*
Rowlandson, Gordon; Reeve, Douglas W.; and Rapson, W. Howard, 4,104,114, Cl. 162-29.000.

Erich, Hans; Jordt, Alfred; and Konig, Klaus, to Anschutz & Co. G.m.b.H. Lubricating system for an antifriction bearing. 4,103,759, Cl. 184-64.000.

Erickson, Henry, to Atlantic Richfield Company. Method for reforming hydrocarbons. 4,104,153, Cl. 208-138.000.

Erickson, John W., to Kobe, Inc. Downhole cleaner assembly for petroleum wells. 4,103,749, Cl. 175-70.000.

Erickson, Lloyd A.: *See—*
Pliml, Frank V.; and Erickson, Lloyd A., 4,103,854, Cl. 248-235.000.

Ermolaev, Alexandr Ivanovich: *See—*
Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.

Ernest, Robert P., to Ford Motor Company. I-Beam apex seal. 4,104,011, Cl. 418-121.000.

Ernst Leitz Wetzlar GmbH.: *See—*
Mesch, Franz; and Moll, Horst, 4,104,517, Cl. 250-204.000.

Eschweiler Bergwerks-Verein AG: *See—*
Habert, Dietrich, 4,103,732, Cl. 164-147.000.

Espenscheid, Wilton F.; Heilweil, Israel J.; and Yan, Tsoung Y., to Mobil Oil Corporation. Calcite control in an in situ leach operation. 4,103,963, Cl. 299-4.000.

Esser, Hans-Theo: *See—*
Backer, Wolfgang; Wojahn, Heinzbert; Esser, Hans-Theo; Feltgen, Karlheinz; and Weisbeck, Roland, 4,103,404, Cl. 28-255.000.

Ethyl Corporation: *See—*
Hornbaker, Edwin D.; and Nugent, Adam, Jr., 4,104,459, Cl. 528-499.000.
Wollensak, John C.; Shin, Kju Hi; Ihrman, Kryn G.; and Elsey, Paul G., 4,104,255, Cl. 260-45.95C.

Etoh, Kunihiko: *See—*
Nishimura, Hideo; and Etoh, Kunihiko, 4,103,668, Cl. 125-11.0CD.

Etudes Petrolieres Marines, Societe a Responsabilite Limitee: *See—*
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,103,500, Cl. 61-69.00R.

Eue, Ludwig: *See—*
Rohe, Lothar; Schramm, Jurgen; Klauke, Erich; Eue, Ludwig; and Schmidt, Robert Rudolf, 4,104,313, Cl. 260-612.00R.

European Atomic Energy Community (Euratom): *See—*
Debeir, Rene Pierre, 4,103,813, Cl. 228-2.500.
Di Piazza, Learco; and Migoni, Angelo, 4,104,503, Cl. 219-69.00E.

Evans, Dow J. Method and apparatus for celestial navigation. 4,104,722, Cl. 364-455.000.

Evans, John C., Jr., to United States of America, National Aeronautics and Space Administration. Solar cells having integral collector grids. 4,104,084, Cl. 136-89.0CC.

Evans, John C., Jr.; Brandhorst, Henry W., Jr.; Mazaris, George A.; and Scudder, Larry R., to United States of America, National Aeronautics and Space Administration. Application of semiconductor diffusants to solar cells by screen printing. 4,104,091, Cl. 148-188.000.

Evin Industries Ltd.: *See—*
Carmen, Hyman, 4,103,361, Cl. 2-97.000.

Excel Industries, Inc.: *See—*
Mullet, David; Rilling, Raymond J.; and Voth, Elmer D., 4,103,477, Cl. 56-202.000.

Exxon Research & Engineering Co.: *See—*
Burnop, Victor Charles Ernest, 4,104,180, Cl. 252-33.000.
Colclough, Terence, 4,104,179, Cl. 252-32.70E.
Hous, Pierre, 4,104,218, Cl. 260-23.70H.
Klemann, Lawrence P.; and Newman, Gerald H., 4,104,451, Cl. 429-194.000.
Merchant, Philip, Jr.; Powell, F. Luther; and Ohaji, Cosmas O., 4,104,174, Cl. 252-8.55D.
Nishikawa, Eiichiroh; Itoh, Takuji; Maeshima, Tsugio; and Kamiyama, Setsuo, 4,104,361, Cl. 423-239.000.
Whitney, Thomas A.; and Klemann, Lawrence P., 4,104,450, Cl. 429-194.000.
Worley, Arthur C., 4,103,539, Cl. 73-86.000.

Faber, Paul V.; Daly, Edwin R.; and Jain, Prithvi, to Wilputte Corporation. Apparatus and method for recovery of coal fines. 4,104,128, Cl. 201-4.000.

Fabert, Herman A., Jr.: *See—*
Ridenour, Charles E.; Fabert, Herman A., Jr.; Tasker, John; and Larson, Hugo R., 4,104,504, Cl. 219-73.100.

Fackler, David G. Wad column for shotshells. 4,103,621, Cl. 102-95.000.

Fahnoe, Erik: *See—*
Hickey, Robert; and Fahnoe, Erik, 4,103,546, Cl. 73-145.000.
Fairchild Camera and Instrument Corporation: *See—*
Davies, Thomas J., Jr., 4,104,538, Cl. 307-64.000.
Hayes, James A., 4,103,415, Cl. 29-571.000.
Herndon, William H., 4,104,734, Cl. 365-228.000.
Fallier, Charles N., Jr.: *See—*
Proud, Joseph M., Jr.; and Fallier, Charles N., Jr., 4,104,556, Cl. 315-39.000.
Fallis, Alexander Graham; Scott, John Marshall William; and Winter, June Gertrude. Cholesterol separation process. 4,104,286, Cl. 260-397.250.
Fancher, Llewellyn W., to Stauffer Chemical Company. Isoxazole phosphates and phosphonates. 4,104,375, Cl. 424-200.000.
Farrow, Max W.: *See—*
Thomas, Frank J.; and Farrow, Max W., 4,103,847, Cl. 244-3.180.
Faulstich, Eugene W. Pickup truck box enclosure. 4,103,956, Cl. 296-10.000.
Fauran, Claude P.; Turin, Michel J.; Imbert, Thierry F.; Raynaud, Guy M.; and Dorme, Nicole A. M., to Delalande S.A. 1-(2'-Aroyl eth-1'yl) 2-(4''-acetamido piperazine-1''yl methyl) benzimidazoles and their therapeutical applications. 4,104,384, Cl. 424-248.510.
Fauth, Gunter: *See—*
Winkler, Alfred; Lermann, Peter; Engelsmann, Dieter; and Fauth, Gunter, 4,104,664, Cl. 354-213.000.
Feder, Leo. Gravity impact indicator for shipping containers. 4,103,640, Cl. 116-114.0AH.
Fedoseev, Dmitry Valerianovich; Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; Varnin, Valentin Pavlovich; Vnukov, Stanislav Pavlovich; Gerasimenko, Valentin Korneevich; Nikitin, Jury Ivanovich; Tsypin, Nekhemyan Veniaminovich; and Hochko, Anatoly Vasilievich, to Institut Sverkhtverdykh Materialov SSR; and Institut Fizicheskoi Khimii Akademii Nauk. Polycrystalline diamond member and method of preparing same. 4,104,441, Cl. 428-408.000.
Fehn, Thomas Peter: *See—*
Aichelmann, Frederick John, Jr.; Di Pilato, Nino Mario; Fehn, Thomas Peter; and Rudy, George John, 4,103,823, Cl. 235-312.000.
Feinauer, Roland: *See—*
Magosch, Karl-Heinz; Feinauer, Roland; and Ruter, Jorn, 4,104,261, Cl. 260-873.000.
Felch, Donald E.: *See—*
Veinerman, Elliot; Felch, Donald E.; and Peters, Kenneth D., 4,104,149, Cl. 208-64.000.
Felt Products Mfg. Co.: *See—*
McDowell, Donald J., 4,103,913, Cl. 277-235.00B.
Feltgen, Karlheinz: *See—*
Backer, Wolfgang; Wojahn, Heinzbert; Esser, Hans-Theo; Feltgen, Karlheinz; and Weisbeck, Roland, 4,103,404, Cl. 28-255.000.
Fenton, Sidney Desmond, to Storey Brothers and Company Limited. Vacuum formable materials. 4,104,430, Cl. 428-175.000.
Fergg, Berthold; Knapp, Walter; and Zahn, Wolfgang, to AGFA-Gevaert, AG. Method and apparatus for evaluating and processing a strip of originals to be copied. 4,103,996, Cl. 355-32.000.
Ferrand, Gerard; Frehel, Daniel; and Maffrand, Jean-Pierre, to Parcor. Thieno [2,3-c] and [3,2-c] pyridines. 4,104,390, Cl. 424-256.000.
Ferrante, Michael R. Improved wire stripping apparatus. 4,104,012, Cl. 425-299.000.
Ferrara, William J.: *See—*
Wasilewski, Olgierd; Saltzman, Ronald; and Ferrara, William J., 4,104,143, Cl. 204-159.150.
Ferrin, J. Paul: *See—*
Abdou-Sabet, Sabet; and Ferrin, J. Paul, 4,104,329, Cl. 260-878.00R.
Fetz, James G.; and Jensen, Ronald P. Method for the manufacture of intraocular lenses. 4,104,339, Cl. 264-1.000.
Fidler, Horace E.: *See—*
Isbister, Eric J.; and Fidler, Horace E., 4,104,629, Cl. 343-6.00R.
Fields, Marvin C.; and Wyse, Richard F., to United States Steel Corporation. Low temperature carbonization and desulfurization of coal under elevated pressures. 4,104,129, Cl. 201-17.000.
Fife Corporation: *See—*
Brown, Jerald L.; and Shelton, John J., 4,103,859, Cl. 248-425.000.
Filderman, Rene Gabriel, to Societe Anonyme Francaise du Ferodo. Brake friction-lining support. 4,103,761, Cl. 188-73.500.
Finney, James L. Buffer spring for an impact tool. 4,103,747, Cl. 173-119.000.
Firestone Tire & Rubber Company, The: *See—*
Bank, Thomas A.; Gieck, Jack E.; and Weitzenhof, David A., 4,103,951, Cl. 293-71.00P.
Halasa, Adel Farhan, 4,104,465, Cl. 526-174.000.
Fischbeck, Karl-Heinz, to Olympia Werke AG. Ink ejection. 4,104,646, Cl. 346-140.00R.
Fischbeck, Kenneth H., to Xerox Corporation. Coincidence ink jet. 4,104,645, Cl. 346-140.00R.
Fischer, Frank S., to Stanadyne, Inc. Spout tube assembly. 4,103,709, Cl. 137-615.000.
Fischer, Harry A.; and Wrubel, Richard R., to Baker Perkins Inc. Methods and systems for making aerated candy. 4,104,412, Cl. 426-572.000.
Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Horn, Peter, to BASF Aktiengesellschaft. 4-m,m'-Di-t-butyl-p-hydroxyphenyl) butyl-2 compounds. 4,104,287, Cl. 260-404.000.
Fischer, Ulf; and Hausler, Gunther, to Hoffmann-La Roche Inc. Cardioactive adenosine nitrates. 4,104,462, Cl. 536-26.000.
Fisher, Abraham: *See—*
Cohen, Sasson; and Fisher, Abraham, 4,104,397, Cl. 424-267.000.
Fisher, Robert C.; and Collins, Cecil A., to Fisher, Robert C. Floor anchor for seat belt. 4,103,933, Cl. 280-744.000.
Fisk, Bernard C.; and Verschage, Gerald C., to Xerox Corporation. Programmable controller for controlling reproduction machines. 4,104,726, Cl. 364-518.000.
Fisk, James C. Adjustable instrument mounting bracket. 4,103,852, Cl. 248-178.000.
Fisons Limited: *See—*
Barker, Philip Edwin; Hatt, Brian William; and Ellison, Frederick John, 4,104,078, Cl. 127-46.00R.
Flanigen, Edith Marie: *See—*
Grose, Robert William; and Flanigen, Edith Marie, 4,104,294, Cl. 260-448.00C.
Flatley, Doris W.: *See—*
Ipri, Alfred C.; and Flatley, Doris W., 4,104,087, Cl. 148-1.500.
Fleischmann, Horst, to Gebruder Kommerling Kunststoffwerke GmbH. Arrangement for supporting a railing and the like. 4,104,000, Cl. 403-7.000.
Fleming, Gordon R., to Atkins & Merrill, Inc. High temperature encapsulated electroluminescent lamp. 4,104,555, Cl. 313-512.000.
Fletcher, Edward Horton; and Wiegardt, Gordon K., to Deere & Company. Total power fluid system. 4,103,489, Cl. 60-395.000.
Fletcher, John K. Detachable sling letdown apparatus for lumber sorter. 4,104,156, Cl. 209-74.00R.
Fleury, Guy J.: *See—*
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,103,500, Cl. 61-69.00R.
Fliege, Werner: *See—*
Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Horn, Peter, 4,104,287, Cl. 260-404.000.
Flippin, James Samuel, to J. I. Case Company. Trencher with offset drive wheels. 4,103,441, Cl. 37-86.000.
Flynn, Thomas P.; and Wurster, James C., to Super Products Corporation. Hose reel apparatus. 4,103,841, Cl. 242-86.200.
Fodor, Lawrence M., to Phillips Petroleum Company. Resinous radial-linear copolymer blend having blocks with a heterogeneity index ranging from 2.5 to 4. 4,104,326, Cl. 260-876.00B.
Fogle, Edgar L.: *See—*
Weigle, Wayne L.; Fogle, Edgar L.; Cromer, Oscar M.; and Schafer, Larry C., 4,104,631, Cl. 343-7.00A.
Foley, Nelson D., to Bei Electronics, Inc. Ammunition firing system having means for electrically signaling presence or absence of ammunition. 4,103,585, Cl. 89-1.814.
Fooke, Johannes, to G. L. Rexroth GmbH. Multistage pilot-controlled pressure-reducing valve. 4,103,703, Cl. 137-501.000.
Ford, Michael E.: *See—*
Dixon, Dale D.; Ford, Michael E.; and Mantell, Gerald J., 4,104,264, Cl. 528-370.000.
Ford Motor Company: *See—*
Ernest, Robert P., 4,104,011, Cl. 418-121.000.
Parker, Robert J., 4,103,932, Cl. 280-718.000.
Forkner, John H. Food product having expanded confection and method of manufacture. 4,104,405, Cl. 426-94.000.
Formo, Jerome L.: *See—*
Colato, Albert E.; and Formo, Jerome L., 4,103,736, Cl. 165-78.00R.
Forster, George A., to United States of America, Energy. Pressure sensor for high-temperature liquids. 4,103,555, Cl. 73-706.000.
Forster, Gerhard; and Bohringer, Walter, to RCA Corporation. Horizontal deflection circuit with auxiliary power supply. 4,104,569, Cl. 315-408.000.
Foseco Trading A.G.: *See—*
Yamaji, Nobuyoshi, 4,104,093, Cl. 149-40.000.
Foster, James H.: *See—*
Boudreaux, Lee J.; and Foster, James H., 4,104,605, Cl. 338-2.000.
Foster Wheeler Energy Corporation: *See—*
Steiner, Peter; and Bischoff, William Frederick, 4,103,902, Cl. 277-12.000.
Fountain, Gerald F.; Veloz, Jaime; Bilson, Edward A.; and Cronin,

John A., to Inspiration Consolidated Copper Company. Flotation of sulfide minerals. 4,104,157, Cl. 209-166.000.

Fournier, Erick-Pierre; and Hill, Ethel V. Clamp action sealing device for tab opening cans. 4,103,804, Cl. 220-281.000.

Fowler, John T., to Laitram Corporation, The. Automatic piloting system. 4,103,638, Cl. 114-144.00E.

Fox, Jack J.; and Burchenal, Joseph H., to Research Corporation. 2,2'-Anhydro-beta-D-arabinofuranosyl-5-fluorocytosine. 4,104,461, Cl. 536-23.000.

Fox, Richard Samuel, to Eastman Kodak Company. Timing mechanism for sheet feed apparatus. 4,103,885, Cl. 271-117.000.

Fox, Steve Allen: *See—*
Wilkenloh, Frederic Nash; Wilson, Paul Alan; and Fox, Steve Allen, 4,104,481, Cl. 174-28.000.

Fraider, Harry: *See—*
Wagner, Jerome, 4,103,779, Cl. 211-65.000.

Francis, Walter C., to Trans-ACC, Inc. Multiple spindle dividing head. 4,103,589, Cl. 90-56.00R.

Franco, Colanzi; and Guido, Sapello, to SKF Industrial Trading and Development Company N.V. Differential pinion assembly, especially for motor vehicles. 4,103,567, Cl. 74-710.000.

Frank, Carl S.; Grzybowski, John J.; and Peets, Robert S., to Singer Company, The. Sewing machine track storage system. 4,103,633, Cl. 112-217.100.

Frank, Dieter: *See—*
del Rio, Marija; Behnke, Joachim; Wallrabenstein, Michael; and Frank, Dieter, 4,104,258, Cl. 528-334.000.

Frank, Harry, to ASEA AB. Equipment with controlled reactance. 4,104,576, Cl. 323-102.000.

Frank, Lee Fitzpatrick; and Lee, James Kelly, to Eastman Kodak Company. Piezoelectric electronic shutter control for cameras. 4,104,657, Cl. 354-50.000.

Franke, Kurt, to Siemens Aktiengesellschaft. X-ray diagnostics installation comprising a short-term switching mechanism. 4,104,525, Cl. 250-402.000.

Frankel, Irwin, to Versar, Inc. Method for controlling diameters of microcrystalline mineral fibers. 4,104,395, Cl. 264-60.000.

Franz Plasser Bahnbaumaschinen m.b.H.: *See—*
Theurer, Josef, 4,103,622, Cl. 104-7.00R.

Franzl, Gertrude K. Anatomical digit and appendage-immobilizing device. 4,103,682, Cl. 128-87.00A.

Fravel, John C.: *See—*
Ruble, Frank D.; Chang, Louis H.; and Fravel, John C., 4,103,766, Cl. 197-62.000.

Frazita, Richard F., to Hazeltine Corporation. Doppler reference antenna with phased centerline emphasis. 4,104,636, Cl. 343-106.00D.

Frederiksen, Thomas M.; Sleeth, Robert S.; and Howard, William M., to National Semiconductor Corporation. Extended range current-to-time converter. 4,104,547, Cl. 307-362.000.

Frehel, Daniel: *See—*
Ferrand, Gerard; Frehel, Daniel; and Maffrand, Jean-Pierre, 4,104,390, Cl. 424-256.000.

Freiser, Henry: *See—*
Davis, Phillip K.; Leaver, Helen S.; and Freiser, Henry, 4,104,359, Cl. 423-139.000.

Freller, Walter, to "Wohn-Art" - Freizeitartikel Gesellschaft m.b.H. Mobile home. 4,103,462, Cl. 52-67.000.

Frezza, Robert, to Samcoe Holding Corporation. Edge drive stop mechanism for fabric spreaders. 4,103,402, Cl. 26-74.000.

Friedell, Morley V.: *See—*
United States of America, National Aeronautics and Space Administration; and Friedell, Morley V., 4,103,712, Cl. 137-637.050.

Friedman, Harvey S., to Polaroid Corporation. Thermally responsive photographic processing apparatus for use with self-processable film units. 4,104,669, Cl. 354-304.000.

Fron, Frode. Plastic foot protector. 4,103,438, Cl. 36-72.00R.

Frontier Electronics, Inc.: *See—*
Cochran, John M., Jr., 4,104,696, Cl. 361-229.000.

Frost, Richard Butler; Juhasz, Joseph Laszlo; and Wing, Barry Walter, to Unisearch Limited. Pilot's kneepad. 4,103,809, Cl. 224-5.00R.

Fry, Raymond C.: *See—*
Eagon, Beverly M.; Carlson, Russell L.; and Fry, Raymond C., 4,104,102, Cl. 156-298.000.

Fuji Oil Company, Limited: *See—*
Iwanaga, Yukiya; and Kubota, Hayato, 4,104,288, Cl. 260-412.800.

Fuji Photo Film Co., Ltd.: *See—*
Fukuda, Susumu, 4,104,662, Cl. 354-187.000.
Suzuki, Osamu; Ueda, Masaki; and Ishii, Akira, 4,104,436, Cl. 428-297.000.
Utsui, Masaaki; Tsuruta, Hikaru; Mizutani, Shigemitsu; and Shimizu, Shigehisa, 4,103,575, Cl. 83-298.000.

Fujii, Sakumi; Uchida, Masao; and Watanabe, Osamu, to Toyo Soda Manufacturing Co., Ltd. Method of removing scale caused by raffinate in a phosphoric acid purification process. 4,104,079, Cl. 134-2.000.

Fujiki, Norio; and Endo, Hiroshi, to Nissan Motor Company, Limited. System for preventing collision of vehicles. 4,104,632, Cl. 343-7.0VM.

Fujikura, Yoshiaki: *See—*
Inamoto, Yoshiaki; Aigami, Koji; Ohsugi, Motoyoshi; Fujikura, Yoshiaki; and Ikeda, Hiroshi, 4,104,305, Cl. 260-563.00P.

Fujimaki, Taketoshi; Shijima, Shoji; and Harada, Shunichi, to Kawasaki Steel Corporation. Method of producing highly corrosion resistant tin-plated steel sheet. 4,104,135, Cl. 204-37.00T.

Fujimoto, Teruo: *See—*
Nagasawa, Mitsuru; Fujimoto, Teruo; and Tago, Kazuo, 4,104,455, Cl. 526-173.000.

Fujimura, Eiji. Automatic system for providing telephone number information service. 4,104,717, Cl. 364-200.000.

Fujisawa, Isao: *See—*
Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; Hashimoto, Sadakatsu; Takeda, Yoshio; Ishii, Mitsuo; and Kitanishi, Yoshitomo, 4,104,727, Cl. 364-710.000.

Fujita, Teizo; Yoshida, Shunzo; and Koizumi, Toshio, to Izumi Denki Corporation. Pneumatic timer. 4,104,602, Cl. 335-61.000.

Fujitsu Limited: *See—*
Nishioka, Hideya, 4,103,814, Cl. 228-6.00A.

Fukuda, David S.; Abbott, Bernard J.; and Archer, Robert A., to Eli Lilly and Company. Novel 3-(oxygenated alkyl)-1,9-dihydroxy and 1-hydroxy-9-keto dibenzo[b,d]pyrans. 4,104,282, Cl. 260-345.300.

Fukuda, Susumu, to Fuji Photo Film Co., Ltd. Folding type photographic camera. 4,104,662, Cl. 354-187.000.

Fukushima, Tadahide: *See—*
Hosoe, Kazuya; Matsumoto, Seiichi; Hashimoto, Shigeru; Iwashita, Tomonori; Fukushima, Tadahide; and Yokota, Hideo, 4,104,650, Cl. 354-25.000.

Fuller, Aubrey M.: *See—*
Burdette, Robert E.; and Fuller, Aubrey M., 4,103,728, Cl. 160-368.00R.

Fulton, Frank F., to Raymond Lee Organization, Inc., The, a part interest. Board game. 4,103,898, Cl. 273-248.000.

Funke, Wilhelm; Honke, Heinrich; and Simonides, Heinz, deceased (by Simonides, Charlotte, executrix), to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H. Mining machine particularly a drum-cutter mining machine. 4,103,975, Cl. 299-43.000.

Furmaga, Robert Edwin: *See—*
Labit, Sidney James; and Furmaga, Robert Edwin, 4,103,710, Cl. 137-624.130.

Furuichi, Mitsuyuki: *See—*
Sato, Isao; Gomi, Shigenori; and Furuichi, Mitsuyuki, 4,103,873, Cl. 254-168.000.

Fuwa, Sinji: *See—*
Kuri, Setuya; and Fuwa, Sinji, 4,104,039, Cl. 55-23.000.

Fuzek, John Frank, to Eastman Kodak Company. Textile fiber. 4,104,439, Cl. 428-397.000.

G. D. Searle & Co.: *See—*
Baran, John S.; and Laos, Ivar, 4,104,271, Cl. 260-239.570.

G. L. Rexroth GmbH: *See—*
Fooke, Johannes, 4,103,703, Cl. 137-501.000.

G. M. Tool Corporation: *See—*
Moeller, Richard H., 4,103,798, Cl. 215-305.000.

Gadek, Thomas Richard; Sclove, David Berhard; and Vollmer, Robert Lee, to International Business Machines Corporation. Synthesis of squaric acid. 4,104,308, Cl. 260-586.00R.

GAF Corporation: *See—*
Azorlosa, Julian L., 4,104,458, Cl. 526-264.000.
Loofbourow, Donald I.; and Lach, Robert E., 4,103,846, Cl. 242-205.000.

Gallagher, Gregory, Jr.; Pfeiffer, Francis R.; and Weinstock, Joseph, to SmithKline Corporation. Substituted 1-alkylthiophenyl-2,3,4,5-tetrahydro-1H-3-benzazepine compounds. 4,104,379, Cl. 424-244.000.

Gallo-Torres, Hugo; Guthrie, Robert William; Hamilton, James Guthrie; Kierstead, Richard Wightman; and Sullivan, Ann Clare, to Hoffmann-La Roche Inc. Taurine and glycine derivatives. 4,104,285, Cl. 260-397.100.

Gamber-Johnson, Inc.: *See—*
Morrison, Lowell D.; and Moon, Howard R., 4,103,983, Cl. 339-91.00R.

Gana, John: *See—*
Capriotti, Alfred J.; Gana, John; and Korpela, Thomas J., 4,103,903, Cl. 277-27.000.

Ganellin, Charon Robin: *See—*
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,104,381, Cl. 424-246.000.

Gannon, John Allister: *See—*
Nelson, Robert C.; Gannon, John Allister; and Shen, Kwan Ting, 4,104,224, Cl. 260-29.40R.

Garabedian, Armen. Process for making a plastic sheet. 4,104,101, Cl. 156-285.000.
Garcea, Giampaolo, to Alfa Romeo S.p.A. Mixture feed regulation device for an internal-combustion engine. 4,104,337, Cl. 261-39.00A.
Garrett, George A.; and Shacter, John, to United States of America, Energy. Gaseous diffusion system. 4,104,037, Cl. 55-16.000.
Garside, Arthur F.; and Avery, Dudley D., to Colt Industries Operating Corp. Auxiliary engine governing system. 4,103,652, Cl. 123-103.00R.
Gartshore, Peter A.; and Ward, James O., to Pak-Well Corporation. Shipping envelope. 4,103,821, Cl. 229-74.000.
Gass, Hans; Hintermann, Hans Erich; and Griepentrog, Hartmut, to Laboratoire Suisse de Recherches Horlogeries; and Gutehoffnungshutte Sterkrade Aktiengesellschaft. Diffusion barrier and separation substance for metal parts adjoining each other in an oxygen free atmosphere. 4,104,096, Cl. 156-89.000.
Gaston, Charles O. Conditioner drill. 4,103,628, Cl. 111-52.000.
Gates Rubber Company, The: *See—*
Hush, James M.; and McPhee, Donald J., 4,104,098, Cl. 156-149.000.
Pennell, Phillip E., 4,103,410, Cl. 29-403.000.
Gaucher, Jean-Claude: *See—*
Lansiart, Alain; Gaucher, Jean-Claude; Lequais, Jean; Moretti, Jean-Luc; and Quettier, Annick, 4,103,677, Cl. 128-2.00V.
Gaudel, Jacques. Apparatus for successively positioning a series of radiographic film cassettes at a film-exposing station. 4,104,529, Cl. 250-470.000.
Gay, Robert L.; Schlott, Richard J.; and Burroughs, James E., to Borg-Warner Corporation. Gelling agents for hydrocarbon compounds. 4,104,173, Cl. 252-8.55R.
Gayle, Harold R.: *See—*
Wagner, Walter D.; and Gayle, Harold R., 4,103,705, Cl. 137-544.000.
Gaz de France: *See—*
Alin, Jean-Marie Georges Fernand, 4,104,017, Cl. 431-352.000.
Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H.: *See—*
Funke, Wilhelm; Honke, Heinrich; and Simonides, Heinz, deceased, 4,103,975, Cl. 299-43.000.
Nowacki, Georg; and Weber, Karl-Heinz, 4,103,974, Cl. 299-43.000.
Gebruder Kommerling Kunststoffwerke GmbH: *See—*
Fleischmann, Horst, 4,104,000, Cl. 403-7.000.
Gebrueder Heller, Maschinenfabrik Gesellschaft mit beschraenkter Haftung: *See—*
Schmid, Karlheinz, 4,103,588, Cl. 90-11.00A.
Geffroy, Robert. Piston and scraper ring assembly. 4,103,594, Cl. 92-159.000.
Gehrmann, Klaus: *See—*
Ohorodnik, Alexander; Gehrmann, Klaus; Schafer, Stefan; and Mainski, Albert, 4,104,299, Cl. 260-543.00P.
Schafer, Stefan; Gehrmann, Klaus; Ohorodnik, Alexander; Steil, Karl-Heinz; Riechmann, Wernfried; and Bylsma, Friedhelm, 4,104,304, Cl. 260-543.00P.
Gelhaar, Hans-Georg: *See—*
Radlmann, Eduard; Gelhaar, Hans-Georg; and Nischk, Gunther, 4,104,324, Cl. 260-857.0TW.
General Atomic Company: *See—*
Housman, Joseph J., 4,104,118, Cl. 176-38.000.
General Cable Corporation: *See—*
Bahder, George; Eager, George S., Jr.; Dima, Attila F.; and Walker, James J., 4,104,479, Cl. 174-22.00R.
Thompson, Paul F., 4,104,480, Cl. 174-23.00C.
General Electric Company: *See—*
Boudreaux, Lee J.; and Foster, James H., 4,104,605, Cl. 338-2.000.
Brealey, Robert Harwood, 4,104,497, Cl. 200-305.000.
Davis, Donald H., 4,103,592, Cl. 91-448.000.
Ehrich, Frederic Franklin, 4,104,002, Cl. 415-119.000.
Eldridge, John S., Sr., 4,103,527, Cl. 72-75.000.
Hanson, James M.; Palagyi, Stanley S.; and Povall, Gerald W., 4,104,706, Cl. 362-10.000.
Hesler, Joseph P., 4,104,619, Cl. 340-629.000.
Kochanowski, John Edward; and Wambach, Allen Dale, 4,104,242, Cl. 260-40.00R.
Levand, Victor A., Jr.; and Lenkner, William A., 4,104,705, Cl. 362-5.000.
Mark, Victor; and Wilson, Phillip Steven, 4,104,231, Cl. 260-30.80R.
Mark, Victor, 4,104,245, Cl. 260-45.70S.
Mark, Victor, 4,104,246, Cl. 260-45.70S.
Mark, Victor, 4,104,253, Cl. 260-45.8RW.
General Electric Company Limited, The: *See—*
Newbould, Adrian Orton; Walker, Edward Piper; and Williams, Anthony, 4,104,586, Cl. 324-83.00D.
General Foods Corporation: *See—*
Mathison, Frederic N.; and Straub, Roger E., 4,103,820, Cl. 229-37.00R.
Shanbhag, Sudhakar P.; Liggett, Louis G.; and Mikovits, Adrienne C., 4,104,415, Cl. 426-656.000.
Stringer, William G.; Schara, Robert E.; and Stocker, Charles T., 4,104,406, Cl. 426-99.000.
Stringer, William G.; Schara, Robert E.; and Stocker, Charles T., 4,104,407, Cl. 426-99.000.
General Trailer Company, Inc.: *See—*
Schmidt, Kenneth J., 4,103,752, Cl. 177-141.000.
Schmidt, Kenneth J., 4,103,927, Cl. 280-482.000.
Genzling, Claude. Method and structure for orienting a bicycle pedal. 4,103,563, Cl. 74-594.500.
George, Delbert L., to Gould Inc. Narrowly knauled end cap for an electric fuse. 4,104,604, Cl. 337-248.000.
Geosource Inc.: *See—*
Smither, Miles A., 4,104,596, Cl. 330-9.000.
Gerasimenko, Valentin Korneevich: *See—*
Fedoseev, Dmitry Valerianovich; Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; Varnin, Valentin Pavlovich; Vnukov, Stanislav Pavlovich; Gerasimenko, Valentin Korneevich; Nikitin, Jury Ivanovich; Tsypin, Nekhemyan Veniaminovich; and Hochko, Anatoly Vasilievich, 4,104,441, Cl. 428-408.000.
Gerber, Howard L., to Continental Group, Inc., The. Apparatus for and method of induction heating of metal plates with holes. 4,104,498, Cl. 219-10.430.
Gerigk, Gunter: *See—*
Hammer, Klaus-Dieter; Gerigk, Gunter; and Bytzek, Max, 4,104,444, Cl. 428-474.000.
Gesell, Hartmut: *See—*
Wessel, Otto; Hofmann, Georg; Gesell, Hartmut; and Scholz, Werner, 4,104,342, Cl. 264-12.000.
GF Business Equipment, Inc.: *See—*
Donahue, Charles R.; and Terlecki, Leo, 4,103,981, Cl. 312-257.00A.
Gibbons, John P.: *See—*
Chiang, Mutong T.; and Gibbons, John P., 4,104,213, Cl. 260-17.300.
Gibson, George M. Spiral dasher for washing machines. 4,103,522, Cl. 68-133.000.
Gibson, John George; and Tilley, Alec Roger, to British Railways Board. Alkali metal-sulphur cells. 4,104,448, Cl. 429-72.000.
Giebel, Wolfgang; and Krause, Herbert, to Siemens Aktiengesellschaft. Sealing member for cable inlets. 4,103,911, Cl. 277-210.000.
Gieck, Jack E.: *See—*
Bank, Thomas A.; Gieck, Jack E.; and Weitzenhof, David A., 4,103,951, Cl. 293-71.00P.
Gillard, Paul O.; and Whiting, Kenneth B., to Commonwealth of Australia, The. Ground plane corner reflectors for navigation and remote indication. 4,104,634, Cl. 343-18.00C.
Gingell, Michael J., to International Standard Electric Corporation. Digital multiplier. 4,104,729, Cl. 364-757.000.
Gitcho, Theodore N., to Mr. Drumstick, Inc. Cooking device. 4,103,606, Cl. 99-443.00C.
Gits, Norbert W. Rotary seal with resilient diaphragm. 4,103,906, Cl. 277-88.000.
Gitt, Jeffrey J. Adhesive device for cleaning hard to reach areas. 4,103,382, Cl. 15-104.00R.
Glass, Carl R. Spear points for fence structure and method. 4,103,875, Cl. 256-59.000.
Glass Industry Consultants, Inc.: *See—*
McCreery, Cecil Wayne, 4,104,046, Cl. 65-161.000.
Glassman, Donald: *See—*
Didycz, William J.; Glassman, Donald; Maier, Edward E.; and Saniga, George T., 4,104,131, Cl. 203-7.000.
Glessner, James Stoy. Adjustable wooden studio bench. 4,103,969, Cl. 297-311.000.
Glockner, Erhard; and Wittstadt, Anton, to Siemens Aktiengesellschaft. Braking device for drive motors. 4,103,763, Cl. 192-2.000.
Glover, Douglas Wade: *See—*
Herrmann, Henry Otto, Jr.; and Glover, Douglas Wade, 4,104,521, Cl. 250-324.000.
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Sawa, Natsuo; and Gohda, Kyoko, 4,104,473, Cl. 548-342.000.
Gold-Zack Werke AG: *See—*
Brues, Friedrich E., 4,103,485, Cl. 66-192.000.
Golda, Eugene; Wilkes, Alan Leonard; and Chu, Simon Long, to Polychrome Corporation. Water developable lithographic printing plate having dual photosensitive layering. 4,104,072, Cl. 96-68.000.
Golden Wonder Limited: *See—*
Moss, Alan, 4,103,751, Cl. 177-122.000.

Goldwell GmbH Chemische Fabrik H.E. Dotter: *See*—
Wittersheim, Adam, 4,103,900, Cl. 277-2.000.
Gomez, I. Luis, to Monsanto Company. Polyethylene modifiers for high nitrile polymers. 4,104,336, Cl. 260-897.00A.
Gomez, Magdalena Usategui; Gurien, Harvey; Heveran, John Edward; and Weigele, Manfred, to Hoffmann-La Roche Inc. Radioimmunoassay for methadone. 4,104,367, Cl. 424-1.000.
Gomi, Shigenori: *See*—
Sato, Isao; Gomi, Shigenori; and Furuichi, Mitsuyuki, 4,103,873, Cl. 254-168.000.
Gonsior, Michael J., to United States of America, Agriculture. Single line, traction driven running skyline system. 4,103,784, Cl. 212-94.000.
Gonzalez, Rodolfo; and Penton, Allen P., III, to McDonnell Douglas Corporation. Production of muffler material. 4,104,426, Cl. 428-36.000.
Goodyear Tire & Rubber Company, The: *See*—
Cunningham, Robert E., 4,104,331, Cl. 260-880.00B.
Novotny, Donald S.; Marsh, Richard L.; Masters, Frank C.; and Tally, David N., 4,104,205, Cl. 260-2.300.
Wolfe, James D., 4,103,726, Cl. 152-330.00R.
Gorlov, Alexander Moiseevich. Apparatus for harnessing tidal power. 4,103,490, Cl. 60-398.000.
Goshima, Takeshi; Sugiura, Yoshinori; Endo, Kiyonobu; Sato, Hideaki; and Kono, Kimio, to Canon Kabushiki Kaisha. Speed control device for a moving member. 4,104,573, Cl. 318-640.000.
Goto, Tateo: *See*—
Murata, Takao; Nakamura, Nobutaka; and Goto, Tateo, 4,104,698, Cl. 361-321.000.
Gottsegen, Marten. Blow molding method. 4,103,411, Cl. 29-416.000.
Gould, Donald M.: *See*—
Kelly, Eugene R.; and Gould, Donald M., 4,104,013, Cl. 425-324.100.
Gould, Herman Ray: *See*—
Sutcliffe, Grenville G.; Washausen, Roy F.; Tomes, William L.; and Gould, Herman Ray, 4,103,936, Cl. 285-26.000.
Gould Inc.: *See*—
Blumenthal, John; and Brown, Arling Dix, Jr., 4,104,648, Cl. 346-163.000.
Duble, Gerald R., 4,104,491, Cl. 200-50.00A.
George, Delbert L., 4,104,604, Cl. 337-248.000.
Goulter, Victor Harold. Vibrating disc separator. 4,103,777, Cl. 209-43.000.
Graef, Myron Lee, to De Laval Separator Company, The. Air eliminator for pumps. 4,104,004, Cl. 417-313.000.
Graef, Richard W., to Allis-Chalmers Corporation. Apparatus for removing solids from the water seal trough of an annular material cooler. 4,103,878, Cl. 266-78.000.
Graham, Gordon L., to Rhode, Richard, a part interest. Flow control device for an irrigation ditch. 4,103,495, Cl. 61-12.000.
Grahame, Robert E., Jr.: *See*—
Covey, Rupert A.; and Grahame, Robert E., Jr., 4,104,401, Cl. 424-303.000.
Grainger, Frederick: *See*—
Jones, John H.; Schoenleber, Donald W.; and Grainger, Frederick, 4,103,444, Cl. 40-124.100.
Granados, Javier F. Portable-three-in-one bicycle tool. 4,103,378, Cl. 7-138.000.
Granger, Edward Maurice, to Eastman Kodak Company. Video recording apparatus. 4,104,683, Cl. 360-9.000.
Grapes, Eugene F.: *See*—
Patterson, W. W., III; and Grapes, Eugene F., 4,103,871, Cl. 254-164.000.
Grau, Thomas George; and Tompsett, David Elliott, to Bell Telephone Laboratories, Incorporated. Apparatus for bonding electrical contacts to printed wiring circuit boards. 4,104,109, Cl. 156-521.000.
Gray, Sharon Mae. Embroidery punch. 4,103,631, Cl. 112-80.000.
Greb, Wolfgang: *See*—
Schmidt-Dunker, Manfred; and Greb, Wolfgang, 4,104,366, Cl. 424-1.000.
Green Cross Corporation, The: *See*—
Ishii, Shozo, 4,103,687, Cl. 128-214.00R.
Takechi, Kazuo; Takahashi, Tsuyoshi; Inaba, Toyoaki; and Hasegawa, Eiichi, 4,104,125, Cl. 195-66.00R.
Green, Melvin G.: *See*—
Clifft, Dale L.; and Green, Melvin G., 4,103,464, Cl. 52-127.000.
Green, Michael: *See*—
Stone, Francis Gordon Albert; Green, Michael; Scholes, Gary; and Spencer, John Lionel, 4,104,471, Cl. 544-178.000.
Green, Winje: *See*—
Hemborg, Goeran; Green, Winje; Lang-ree, Nils; and Baker, Edward D., 4,103,605, Cl. 99-345.000.
Greenheck, Robert R. Load carrying dolly with secured post casters. 4,103,919, Cl. 280-79.10A.
Greenwood, Ivan Anderson, to Singer Company, The. Magnetic resonance apparatus. 4,104,577, Cl. 324-0.50F.
Greer, Albert H.: *See*—
Mikes, John A.; Greer, Albert H.; and Norwood, Amos, 4,104,209, Cl. 521-62.000.
Greer, H. William. Tool assembly, method of manufacture and components thereof. 4,103,574, Cl. 83-140.000.
Gregg, Peter P.: *See*—
Hutchison, Robert V.; Gregg, Peter P.; and MacBride, James J., 4,104,700, Cl. 361-384.000.
Gregory, Raymond A.; and Wilcox, DeWitt Gifford, to Clecon Incorporated. Method for making flexible duct. 4,104,097, Cl. 156-143.000.
Grenfell, Hugh Willmott; and Bowen, David James, to British Steel Corporation. Steelmaking. 4,104,058, Cl. 75-60.000.
Greven, Hendrik Marie; and de Wied, David, to Akzona Incorporated. Psychopharmacologically active peptides and peptide-derivatives, and the use thereof. 4,104,371, Cl. 424-177.000.
Greyhound Exhibitgroup, Inc.: *See*—
McDonald, Leo S., Jr., 4,103,465, Cl. 52-127.000.
Griepentrog, Hartmut: *See*—
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Griessner, Peter: *See*—
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Griffin, William P., Jr.: *See*—
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Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and Deeva, Alexandra Ivanovna, administratrix, 4,103,745, Cl. 173-57.000.
Grose, Robert William; and Flanigen, Edith Marie, to Union Carbide Corporation. Crystalline silicates and method for preparing same. 4,104,294, Cl. 260-448.00C.
Grosse-Entrup, Hubert, to Jean Walterscheid GmbH. Telescoping torque transmitting shaft. 4,103,514, Cl. 64-23.700.
Grosse, Maurice. Support systems for articles of furniture. 4,103,855, Cl. 248-246.000.
Grosser, Christian E. Constant velocity universal joint. 4,103,513, Cl. 64-21.000.
Grote & Hartmann GmbH & Co KG: *See*—
Konnemann, Alfred, 4,104,699, Cl. 361-349.000.
Groupement Atomique Alsacienne Atlantique: *See*—
Malaval, Claude, 4,104,121, Cl. 176-86.00R.
Malaval, Claude; and Picou, Jean-Loup, 4,104,122, Cl. 176-86.00L.
Grubelich, Francis Thomas, to Combustion Engineering, Inc. Static fuel holddown system. 4,104,120, Cl. 176-50.000.
Gruber, Robert J., to Xerox Corporation. Photoelectrophoretic imaging method employing dinaphtho-furan-dione pigments. 4,104,064, Cl. 96-1.0PE.
Grudowski, Raymond A.; and Struger, Odo J., to Allen-Bradley Company. Asynchronous coupling of data between a word-oriented I/O module and the memory of a programmable controller. 4,104,731, Cl. 364-900.000.
Grumman Aerospace Corporation: *See*—
Wakefield, Fancher B., 4,103,937, Cl. 285-110.000.
Gruner, Ronald Hans, to Data General Corporation. CPU/Parallel processor interface with microcode extension. 4,104,720, Cl. 364-200.000.
Grutsch, James F., to Standard Oil Company a corporation of Indiana. Regeneration of fixed bed filters. 4,104,163, Cl. 210-80.000.
Gryctko, Carl E., to I-T-E Imperial Corp. Direct fault tripping of circuit breaker having solid state trip means. 4,104,601, Cl. 335-6.000.
Grzybowski, John J.: *See*—
Frank, Carl S.; Grzybowski, John J.; and Peets, Robert S., 4,103,633, Cl. 112-217.100.
GSW Limited - GSW Limitee: *See*—
Smith, David G., 4,103,671, Cl. 126-200.000.
GTE Laboratories Incorporated: *See*—
Proud, Joseph M., Jr.; and Fallier, Charles N., Jr., 4,104,556, Cl. 315-39.000.
Proud, Joseph M., Jr., 4,104,557, Cl. 315-39.000.
Proud, Joseph M., Jr.; and McNeill, William H., 4,104,558, Cl. 315-39.000.
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Muller, Hans; and Guazzone, Bruno, 4,104,169, Cl. 210-331.000.
Guerrieri, Salvatore A. Bubble cap tray. 4,104,338, Cl. 261-114.0TC.

Guettel, Marvin A.: *See—*
Dix, James Allen; Guettel, Marvin A.; and Aslin, Michael, 4,104,724, Cl. 364-477.000.
Guido, Sapello: *See—*
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Guillot, Edmund P.: *See—*
Benoit, Roland A.; and Guillot, Edmund P., 4,103,376, Cl. 5-331.000.
Gulf Oil Corporation: *See—*
Clampitt, Bert H., 4,104,216, Cl. 260-23.0AR.
Dahle, Norman A., deceased, 4,104,053, Cl. 71-90.000.
Gulf Research & Development Company: *See—*
Cronauer, Donald C.; and Kehl, William L., 4,104,200, Cl. 252-465.000.
Hupp, Stephen S.; Sabourin, Edward T.; Swift, Harold E.; and Vogel, Roger F., 4,104,318, Cl. 260-669.00A.
Onopchenko, Anatoli; Schulz, Johann G.; and Sabourin, Edward T., 4,104,281, Cl. 260-343.30R.
Gulf & Western Corporation: *See—*
Baier, Robert J.; Anderson, Vern; and Aseltine, William S., 4,103,692, Cl. 131-32.000.
Guptill, Frank E., Jr.: *See—*
Cole, Edward L.; Hess, Howard V.; and Guptill, Frank E., Jr., 4,104,035, Cl. 44-51.000.
Gurien, Harvey: *See—*
Gomez, Magdalena Usategui; Gurien, Harvey; Heveran, John Edward; and Weigele, Manfred, 4,104,367, Cl. 424-1.000.
Gurwicz, David; and Sloan, Albert Everett, to Sevcon Limited. Pulse controllers. 4,104,571, Cl. 318-380.000.
Gustafson, Burch O. Vented waterproof pants. 4,103,364, Cl. 2-406.000.
Gutehoffnungshutte Sterkrade Aktiengesellschaft: *See—*
Gass, Hans; Hintermann, Hans Erich; and Griepentrog, Hartmut, 4,104,096, Cl. 156-89.000.
Guthrie, Richard E.; and Allenbach, Ronald L. Tool apparatus for mounting on a housing. 4,103,557, Cl. 74-102.000.
Guthrie, Robert William: *See—*
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Gutsche, Klaus: *See—*
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Gutsfeld, Anton Franz. Stream -or river-powered turbine. 4,104,536, Cl. 290-54.000.
Guzick, Lawrence L. Pipe joint alignment measuring tool. 4,103,428, Cl. 33-180.00R.
H.L.S. Ltd., Industrial Engineering Company: *See—*
Koslowsky, Ladislav, 4,104,290, Cl. 260-428.500.
Haas, Charles A.; and Schenken, John E. Mirror holder. 4,103,860, Cl. 248-467.000.
Haas, Herbert: *See—*
Munk, Edmund; Haas, Herbert; and Weinberg, Gerd, 4,104,348, Cl. 264-121.000.
Haase, Jaroslav: *See—*
Wegmuller, Hans; and Haase, Jaroslav, 4,104,160, Cl. 210-36.000.
Haber, Terry M. Combination package and rack for pool balls. 4,103,773, Cl. 206-315.00B.
Habermeier, Jurgen: *See—*
Buxbaum, Lothar; Kainmuller, Thomas; and Habermeier, Jurgen, 4,104,297, Cl. 528-289.000.
Habert, Dietrich, to ARBED, Acieries Reunies de Burbach-Eich-Dudelange S.A.; and Eschweiler Bergwerks-Verein AG. Device for the delivery and uniform distribution of lubricants. 4,103,732, Cl. 164-147.000.
Hachisu, Takeshi; and Uchida, Akinari, to Hitachi, Ltd. Process for reprocessing atactic polypropylene. 4,104,206, Cl. 260-2.300.
Hafner, Erich. Outdoor light fixture. 4,104,712, Cl. 362-218.000.
Hagemann, Hermann: *See—*
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Hagendorn, Heinrich, to Siemens Aktiengesellschaft. Hydraulic positioner for valves. 4,103,864, Cl. 251-63.600.
Haghino, Sadaaki: *See—*
Akimoto, Yumi; Ishii, Tamotsu; Yoshizumi, Motohiko; and Haghino, Sadaaki, 4,104,549, Cl. 310-26.000.
Hagino, Daiji: *See—*
Taniguchi, Tadashi; Miyaoka, Takeshi; Hagino, Daiji; Matsumoto, Ken-ichi; Sakamoto, Kazuo; Matsuda, Akira; and Shishido, Toshio, 4,103,776, Cl. 209-73.000.
Hahn, Franz-Josef: *See—*
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Hahn, Heinrich; Heumann, Hans; Liebing, Heinz; Schweppe, Manfred; and Hilt, Walter, to Veba-Chemie Aktiengesellschaft. Process for the manufacture of ammonium polyphosphate. 4,104,362, Cl. 423-315.000.
Halasa, Adel Farhan, to Firestone Tire & Rubber Company, The. High-vinyl homopolymers and copolymers of butadiene. 4,104,465, Cl. 526-174.000.
Halasz, Peter: *See—*
Benjamin, Adrian; Churgin, Walter G.; Biermann, Frederick; Benjamin, David W.; Cordell, Finton P.; Tempkin, Robert M.; Zambrano, Carl A.; and Halasz, Peter, 4,103,424, Cl. 32-32.000.
Halbach and Braun: *See—*
Braun, Ernst; and Braun, Gert, 4,103,832, Cl. 241-38.000.
Hall, H. Tracy: *See—*
Pope, Bill J.; Horton, M. Duane; and Hall, H. Tracy, 4,104,344, Cl. 264-42.000.
Hall, John B.; and Wiegers, Wilhelmus Johannen, to International Flavors & Fragrances Inc. Perfume compositions containing catechol-camphene reaction products. 4,104,203, Cl. 252-522.000.
Hall, L. D. Sand release apparatus for a pump. 4,103,739, Cl. 166-105.000.
Hall & Myers: *See—*
Rabinow, Jacob, 4,103,570, Cl. 76-110.000.
Hall, Nigel; Price, Raymond; and Rowbotham, Philip Martin, to Imperial Chemical Industries Limited. Process for the manufacture of aromatic phosphonates. 4,104,270, Cl. 260-205.000.
Hall, Roger W. Portable cooling chest operatively attachable to an automobile air conditioning system. 4,103,510, Cl. 62-299.000.
Hall, Wilbur S.: *See—*
Steinbrecher, Lester; and Hall, Wilbur S., 4,104,424, Cl. 427-435.000.
Hallman, Arthur E., Jr.: *See—*
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Hallman, Edward L.; and Hallman, Arthur E., Jr. Watchband. 4,103,808, Cl. 224-4.00D.
Halter, Mark A.: *See—*
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Hamada, Nagaharu, to Hitachi, Ltd. Microprocessor controlled CRT display system. 4,104,624, Cl. 340-324.0AD.
Hamby, Russell; and Ostrander, Kenneth A., to Reliance Electric Company. Digital control system for motors. 4,104,570, Cl. 318-318.000.
Hamilton, James Guthrie: *See—*
Gallo-Torres, Hugo; Guthrie, Robert William; Hamilton, James Guthrie; Kierstead, Richard Wightman; and Sullivan, Ann Clare, 4,104,285, Cl. 260-397.100.
Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Label printing and applying apparatus. 4,104,106, Cl. 156-384.000.
Hammann, Ingeborg: *See—*
Arlt, Dieter; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,104,377, Cl. 424-222.000.
Hammar, Walton J., to Riker Laboratories, Inc. Dibenzo[a,d]cycloheptenes. 4,104,475, Cl. 560-56.000.
Hammer, Klaus-Dieter; Gerigk, Gunter; and Bytzek, Max, to Hoechst Aktiengesellschaft. Fiber reinforced chemically modified protein articles. 4,104,444, Cl. 428-474.000.
Hammonds, James C.; and Holt, Jan D., to ACF Industries, Incorporated. Railway car truck side bearings. 4,103,624, Cl. 105-199.0CB.
Hamprecht, Gerhard: *See—*
Koenig, Karl-Heinz; and Hamprecht, Gerhard, 4,104,298, Cl. 260-543.00R.
Hansch, Ferdinand: *See—*
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Hansen, Clarence M.; Harvey, John P.; and Ledebuhr, Richard L., to Dura Corporation. Pitting device for drupaceous fruit. 4,103,607, Cl. 99-548.000.
Hansen, David R., to Shell Oil Company. Adhesive composition containing a pre-blended polyphenylene ether resin. 4,104,323, Cl. 260-829.000.
Hansen, Lind, Meyer: *See—*
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Hanson, James M.; Palagyi, Stanley S.; and Povall, Gerald W., to General Electric Company. Photoflash lamp array having conductive reflector. 4,104,706, Cl. 362-10.000.
Hanson, Richard A., to Systron-Donner Corporation. Servo system temporary destabilization circuit and method. 4,104,572, Cl. 318-631.000.
Harada, Shunichi: *See—*
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Hare, Kenneth H. Bucket attachment for tractors. 4,103,796, Cl. 214-766.000.
Hargreaves, James Roger: *See—*
Miles, Peter; Hargreaves, James Roger; and Burrows, John, 4,104,423, Cl. 427-402.000.

Hargrove, Daniel J. Asynchronous digital locking system. 4,104,694, Cl. 361-172.000.
Harnischfeger Corporation: *See—*
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Harrigan, Roy M. Photographic printing and developing tray. 4,104,671, Cl. 354-337.000.
Harrington, John Sherman: *See—*
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Harris Corporation: *See—*
Shah, Naren Chimanlal, 4,104,566, Cl. 315-371.000.
Harris, Donald Leal, to Cordis Corporation. Self-suturing cardiac pacer lead. 4,103,690, Cl. 128-418.000.
Harris, Donald Wayne: *See—*
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Harris, Ramsay L. Versatile hand loom. 4,103,715, Cl. 139-33.000.
Harter, B. Wayne. Marine navigational protractor. 4,103,425, Cl. 33-1.0SD.
Hartleben, York: *See—*
Pommer, Ernst-Heinrich; Gutsche, Klaus; and Hartleben, York, 4,104,399, Cl. 424-269.000.
Hartman, Richard L.: *See—*
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Hartshorn, Stephen R., to Minnesota Mining and Manufacturing Company. Generation of chlorine dioxide for disinfection and sterilization. 4,104,190, Cl. 252-187.00R.
Harukawa, Junichi: *See—*
Kato, Yasuo; Ikegami, Tadashi; Harukawa, Junichi; and Kato, Katsuhiko, 4,104,259, Cl. 528-169.000.
Haruna, Tohru: *See—*
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,104,217, Cl. 260-23.0XA.
Harvey, John P.: *See—*
Hansen, Clarence M.; Harvey, John P.; and Ledebuhr, Richard L., 4,103,607, Cl. 99-548.000.
Hase, Alfred Max. Parallel redundant and load sharing regulated AC system. 4,104,539, Cl. 307-64.000.
Hasebe, Nobuyasu. Method for treating seaweed with hydrogen peroxide or hydrogen peroxide compound. 4,104,460, Cl. 536-3.000.
Hasebe, Tetsuzi, to Nissan Motor Company, Limited. Apparatus for removing flues from selvage yarn feeding device of weaving loom. 4,103,714, Cl. 139-1.00C.
Hasegawa, Eiichi: *See—*
Takechi, Kazuo; Takahashi, Tsuyoshi; Inaba, Toyoaki; and Hasegawa, Eiichi, 4,104,125, Cl. 195-66.00R.
Hasegawa, Katsumi; Ando, Akio; Yamazaki, Chikayasu; Okada, Morio; Aoi, Norihiro; and Tanbara, Nobuhiko, to Toray Industries, Inc. Yarn winding apparatus. 4,103,833, Cl. 242-18.00A.
Hashiba, Tatuya: *See—*
Ito, Tsuneo; Hashiba, Tatuya; Inoue, Takesi; and Nagata, Kunihiro, 4,103,406, Cl. 29-125.000.
Hashimoto, Akihiko: *See—*
Maitani, Yoshihisa; Shimoyama, Kunio; Yoshida, Muneaki; Hashimoto, Akihiko; and Kitagawa, Masahiro, 4,104,654, Cl. 354-31.000.
Hashimoto Corporation: *See—*
Hashimoto, Kazuo, 4,104,686, Cl. 360-132.000.
Hashimoto, Kazuo, to Hashimoto Corporation. Tape cassette with reel to reel and endless tapes. 4,104,686, Cl. 360-132.000.
Hashimoto, Sadakatsu: *See—*
Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; Hashimoto, Sadakatsu; Takeda, Yoshio; Ishii, Mitsuo; and Kitanishi, Yoshitomo, 4,104,727, Cl. 364-710.000.
Hashimoto, Shigeru: *See—*
Hosoe, Kazuya; Matsumoto, Seiichi; Hashimoto, Shigeru; Iwashita, Tomonori; Fukushima, Tadahide; and Yokota, Hideo, 4,104,650, Cl. 354-25.000.
Tanaka, Katsumi; Hashimoto, Shigeru; Ohtaki, Shohei; Ito, Tadashi; Iwashita, Tomonori; and Kozuki, Susumu, 4,104,649, Cl. 354-289.000.
Hashimoto, Shintaro: *See—*
Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; Hashimoto, Sadakatsu; Takeda, Yoshio; Ishii, Mitsuo; and Kitanishi, Yoshitomo, 4,104,727, Cl. 364-710.000.
Hasselman, Walter J., Jr.; and Hasselman, Walter J., Sr. Method and apparatus for continuously producing and applying foam. 4,103,876, Cl. 366-178.000.
Hasselman, Walter J., Sr.: *See—*
Hasselman, Walter J., Jr.; and Hasselman, Walter J., Sr., 4,103,876, Cl. 366-178.000.
Hata, Yoshitaka; Masaki, Kenji; and Ikeura, Kenji, to Nissan Motor Company, Ltd. Method of controlling temperature in thermal reactor for engine exhaust gas and ignition system for performing same. 4,103,486, Cl. 60-274.000.
Hatt, Brian William: *See—*
Barker, Philip Edwin; Hatt, Brian William; and Ellison, Frederick John, 4,104,078, Cl. 127-46.00R.
Hauck, Frederic Peter: *See—*
Weisenborn, Frank Lee; Haugwitz, Rudiger D.; and Hauck, Frederic Peter, 4,104,400, Cl. 424-270.000.
Haugwitz, Rudiger D.: *See—*
Weisenborn, Frank Lee; Haugwitz, Rudiger D.; and Hauck, Frederic Peter, 4,104,400, Cl. 424-270.000.
Hausler, Gunther: *See—*
Fischer, Ulf; and Hausler, Gunther, 4,104,462, Cl. 536-26.000.
Hawaiian Trust Company Ltd.: *See—*
Strayer, Larry G., 4,104,512, Cl. 364-439.000.
Hayashi, Takeshi; Shibuno, Masao; Sawaki, Chokei; and Okazaki, Susumu, to Shinagawa Refractories Co., Ltd. Refractories, batch for making the same and method for making the same. 4,104,075, Cl. 106-44.000.
Hayes, James A., to Fairchild Camera and Instrument Corporation. Insulated-gate field-effect transistor with self-aligned contact hole to source or drain. 4,103,415, Cl. 29-571.000.
Hayman, Edgar S., Jr.: *See—*
Anderson, James Douglas; Hayman, Edgar S., Jr.; and Rodzewich, Edward A., 4,104,303, Cl. 260-570.900.
Haytock, Benjamin, III, to Continental Rubber Works. Reinforced oil hose. 4,103,713, Cl. 138-133.000.
Hazeltine Corporation: *See—*
Frazita, Richard F., 4,104,636, Cl. 343-106.00D.
Hechenbleikner, Ingenuin; and Enlow, William Palmer, to Borg-Warner Corporation. Olefin polymer stabilizer. 4,104,252, Cl. 260-45.80R.
Hecht, Ulrich: *See—*
Adalbert, Gerhard; Hess, Jurgen; and Hecht, Ulrich, 4,103,506, Cl. 62-61.000.
Hedblom, Mats-Olov; and Sultan, Sven Gilbert, to Union Carbide Corporation. Low pressure ethylene polymer based compositions. 4,104,256, Cl. 260-45.95D.
Heffler, Jochen, to Licentia Patent-Verwaltungs-G.m.b.H. Method of making gas diffusion electrodes for electrochemical cells with acid electrolytes. 4,104,197, Cl. 252-425.300.
Hehl, Karl. Elastic support for hydraulic pump of injection molding. 4,104,007, Cl. 417-360.000.
HEI, Inc.: *See—*
Wheeler, Jay A.; Miszkiewicz, Henry L.; Lindberg, Ronald O. J.; and Willmore, James A., 4,104,603, Cl. 335-306.000.
Heikes, James E.: *See—*
Sprague, Peter W.; and Heikes, James E., 4,104,467, Cl. 542-442.000.
Heilweil, Israel J.: *See—*
Espenscheid, Wilton F.; Heilweil, Israel J.; and Yan, Tsoung Y., 4,103,963, Cl. 299-4.000.
Heinz, Gerhard: *See—*
Swoboda, Johann; Stephan, Rudolf; and Heinz, Gerhard, 4,104,328, Cl. 260-876.00R.
Hellmuth, Walter W.: *See—*
Chou, Kechia J.; and Hellmuth, Walter W., 4,104,182, Cl. 252-51.50A.
Hellsten, Karl Martin Edvin: *See—*
Martinsson, Eva Margareta; and Hellsten, Karl Martin Edvin, 4,104,175, Cl. 252-8.570.
Helms, C. R.: *See—*
Brandenburger, A. M.; Helms, C. R.; and Barker, D. F., 4,103,770, Cl. 206-193.000.
Hemborg, Goeran; Green, Winje; Lang-ree, Nils; and Baker, Edward D., to N.P.I. Corporation. Meatball cooker. 4,103,605, Cl. 99-345.000.
Henderson, Harold Richard: *See—*
Rieppel, Perry J.; and Henderson, Harold Richard, 4,103,359, Cl. 2-8.000.
Hendrixson, Dale Z.; and Macbeth, John C. Device and method for treating trees. 4,103,456, Cl. 47-57.500.
Henkel Kommanditgesellschaft Auf Aktien: *See—*
Rose, David, 4,104,020, Cl. 8-10.200.
Schmidt-Dunker, Manfred; and Greb, Wolfgang, 4,104,366, Cl. 424-1.000.
Herb, Eugen; and Brekle, Erich, to Trumpf Maschinen AG. Machine tool with at least one tool magazine. 4,103,414, Cl. 29-568.000.
Herbert, John T.; Kovitch, Frank J.; and Sullivan, Paul E., to Murdock Machine & Engineering Company. Multi passage flexible connector. 4,103,939, Cl. 285-137.00A.
Heringer, Ronald, to Natico, Inc. Manual taping device. 4,103,472, Cl. 53-139.300.

Herndon, John W., to United States of America, Navy. Head trackable wide angle visual system. 4,103,435, Cl. 35-12.00N.

Herndon, William H., to Fairchild Camera and Instrument Corporation. Low voltage data retention bias circuitry for volatile memories. 4,104,734, Cl. 365-228.000.

Herrmann, Henry Otto, Jr.; and Glover, Douglas Wade, to AMP Incorporated. Corotron connector. 4,104,521, Cl. 250-324.000.

Herrmann, Manfred: *See—*
Vigelius, Wolf-Dieter; Satzinger, Gerhard; and Herrmann, Manfred, 4,104,380, Cl. 424-244.000.

Hertrick, Thomas P.: *See—*
Smith, David A.; and Hertrick, Thomas P., 4,103,445, Cl. 40-125.00G.

Hertwig, Askan; and Krampitz, Horst, to Riedel-de Haen Aktiengesellschaft. Curing agent for polysulfide-polymer compositions. 4,104,189, Cl. 252-186.000.

Herweh, John E., to Armstrong Cork Company. Synthesis of sulfonyl semicarbazides. 4,104,301, Cl. 260-554.000.

Herzog, Helmut: *See—*
Hohmann, Walter; Herzog, Helmut; and Bien, Hans-Samuel, 4,104,284, Cl. 260-378.000.

Hesler, Joseph P., to General Electric Company. Smoke detector. 4,104,619, Cl. 340-629.000.

Hesler, Kenneth K.: *See—*
Sekmakas, Kazys; and Hesler, Kenneth K., 4,104,229, Cl. 260-29.6RW.

Hess, Howard V.: *See—*
Cole, Edward L.; Hess, Howard V.; and Guptill, Frank E., Jr., 4,104,035, Cl. 44-51.000.

Hess, Jurgen: *See—*
Adalbert, Gerhard; Hess, Jurgen; and Hecht, Ulrich, 4,103,506, Cl. 62-61.000.

Hester, Gerald Paul: *See—*
Sherer, Paul; and Hester, Gerald Paul, 4,104,514, Cl. 235-466.000.

Heumann, Hans: *See—*
Hahn, Heinrich; Heumann, Hans; Liebing, Heinz; Schweppe, Manfred; and Hilt, Walter, 4,104,362, Cl. 423-315.000.

Heveran, John Edward: *See—*
Gomez, Magdalena Usategui; Gurien, Harvey; Heveran, John Edward; and Weigele, Manfred, 4,104,367, Cl. 424-1.000.

Hewlett, Frank Wilson, Jr., to Texas Instruments Incorporated. Static RAM cell. 4,104,732, Cl. 365-179.000.

Hiatt, Martin H. Metal can pelletizer. 4,103,609, Cl. 100-218.000.

Hibino, Yoshihiro; Sasaya, Hideaki; and Kobayashi, Akihiro, to Nippon Soken, Inc. Switch for detecting collision of vehicle. 4,104,493, Cl. 200-61.45R.

Hickey, Christopher Daniel Dowling. Packaging of goods on a vehicle. 4,103,810, Cl. 224-29.00R.

Hickey, Robert; and Fahnoe, Erik. Tennis racquet string tension gauge. 4,103,546, Cl. 73-145.000.

Hickner, Richard A., to Dow Chemical Company, The. Polythioetheralkyleneoxide epoxides. 4,104,283, Cl. 260-348.430.

Hijikata, Akiko: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,104,392, Cl. 424-258.000.

Hildebrandt, Herman F., to United States of America, Army. Method for hydrolyzing phosgene. 4,104,364, Cl. 423-481.000.

Hilfman, Lee, to UOP Inc. Hydrogenation process with sulfided catalyst. 4,104,152, Cl. 208-112.000.

Hill, Ethel V.: *See—*
Fournier, Erick-Pierre; and Hill, Ethel V., 4,103,804, Cl. 220-281.000.

Hill, Loren G. Apparatus and methods for locating, catching and raising fish. 4,103,447, Cl. 43-4.500.

Hill, Louis F. Log cinch. 4,103,955, Cl. 294-92.000.

Hill, William Frank; and Southgate, John Peter, to Lucas Electrical Limited. Starter motor control circuit for an internal combustion engine. 4,104,534, Cl. 290-37.00A.

Hillgenberg, David E. Method of making a perforated, molded container. 4,104,349, Cl. 264-153.000.

Hilt, Walter: *See—*
Hahn, Heinrich; Heumann, Hans; Liebing, Heinz; Schweppe, Manfred; and Hilt, Walter, 4,104,362, Cl. 423-315.000.

Himmelrich, Lew. Safety/tool belt combination. 4,103,758, Cl. 182-3.000.

Hintermann, Hans Erich: *See—*
Gass, Hans; Hintermann, Hans Erich; and Griepentrog, Hartmut, 4,104,096, Cl. 156-89.000.

Hinze, George B., to Walt Disney Productions. Light actuated target control for an amusement device. 4,103,892, Cl. 273-101.100.

Hirano, Taizo, to Japanese Government. Solar battery package. 4,104,083, Cl. 136-89.00H.

Hirasuka, Koki, to Hitachi, Ltd. Overload protection apparatus for hoisting machine. 4,103,872, Cl. 254-168.000.

Hirmann, Georg, to Homberger, Rudolf Felix. Power cell driven by a gaseous or liquid pressure medium. 4,104,425, Cl. 428-12.000.

Hirose, Yutaka: *See—*
Shimoji, Masaharu; Tatsutomi, Yasuo; Hirose, Yutaka; Yamasaki, Atsumichi; and Kikura, Katsuaki, 4,103,666, Cl. 123-219.000.

Hitachi Chemical Company, Ltd.: *See—*
Aimono, Yuji; Omori, Eiji; and Nakano, Mineo, 4,104,215, Cl. 260-22.0CB.

Hitachi, Ltd.: *See—*
Aoki, Shunichi; and Maeda, Eiji, 4,103,731, Cl. 164-147.000.
Hachisu, Takeshi; and Uchida, Akinari, 4,104,206, Cl. 260-2.300.
Hamada, Nagaharu, 4,104,624, Cl. 340-324.0AD.
Hirasuka, Koki, 4,103,872, Cl. 254-168.000.
Inouye, Hiroshi; and Kobayashi, Sadao, 4,103,907, Cl. 277-96.100.
Sato, Isao; Gomi, Shigenori; and Furuichi, Mitsuyuki, 4,103,873, Cl. 254-168.000.
Satoh, Takashi, 4,104,733, Cl. 365-189.000.

Hitachi Medical Corporation: *See—*
Tomita, Chuji; and Abe, Hiroshi, 4,104,527, Cl. 250-445.00T.

Hitachi Metals, Ltd.: *See—*
Ito, Tsuneo; Hashiba, Tatuya; Inoue, Takesi; and Nagata, Kunihiro, 4,103,406, Cl. 29-125.000.

Hobbs, David, to Microwave Associates, Inc. Isopolar magnetron supported with rigid insulation in a remote housing. 4,104,559, Cl. 315-39.510.

Hochko, Anatoly Vasilievich: *See—*
Fedoseev, Dmitry Valerianovich; Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; Varnin, Valentin Pavlovich; Vnukov, Stanislav Pavlovich; Gerasimenko, Valentin Korneevich; Nikitin, Jury Ivanovich; Tsypin, Nekhemyan Veniaminovich; and Hochko, Anatoly Vasilievich, 4,104,441, Cl. 428-408.000.

Hodgson, James H.: *See—*
Kampman, Lester R.; Ulrich, James K.; and Hodgson, James H., 4,103,475, Cl. 56-16.400.

Hoechst Aktiengesellschaft: *See—*
Cargnino, Francesco; and Audisio, Giorgio, 4,104,139, Cl. 204-55.00R.
Hammer, Klaus-Dieter; Gerigk, Gunter; and Bytzek, Max, 4,104,444, Cl. 428-474.000.
Ohorodnik, Alexander; Gehrmann, Klaus; Schafer, Stefan; and Mainski, Albert, 4,104,299, Cl. 260-543.00P.
Schafer, Stefan; Gehrmann, Klaus; Ohorodnik, Alexander; Steil, Karl-Heinz; Riechmann, Wernfried; and Bylsma, Friedhelm, 4,104,304, Cl. 260-543.00P.
Wiezer, Hartmut; Pfahler, Gerhard; and Mayer, Norbert, 4,104,251, Cl. 260-45.80N.

Hoff, Glen R., to Standard Oil Company a corporation of Indiana. Catalyst for the polymerization of ethylene or mixtures of ethylene with terminal olefins. 4,104,199, Cl. 252-430.000.

Hoffman, Michael; and Pape, Rolf, to Borsig Gesellschaft mit beschrankter Haftung. Seal for a drive journal of a ball valve. 4,103,909, Cl. 277-101.000.

Hoffman, Richard Ernest; and Bruckner, Maximiliaan, to Dataproducts (Santa Clara), Inc. Wire stringing device. 4,103,417, Cl. 29-737.000.

Hoffmann, Ernst; Reimann, Siegfried; and Aschermann, Heinz, to Schmidt Kranz & Co. Pump having fluid-actuated motor controlled by fluid-actuated distributor. 4,104,008, Cl. 417-397.000.

Hoffmann-La Roche Inc.: *See—*
Fischer, Ulf; and Hausler, Gunther, 4,104,462, Cl. 536-26.000.
Gallo-Torres, Hugo; Guthrie, Robert William; Hamilton, James Guthrie; Kierstead, Richard Wightman; and Sullivan, Ann Clare, 4,104,285, Cl. 260-397.100.
Gomez, Magdalena Usategui; Gurien, Harvey; Heveran, John Edward; and Weigele, Manfred, 4,104,367, Cl. 424-1.000.
Szkrybalo, William, 4,104,052, Cl. 71-88.000.

Hofmann, Georg: *See—*
Wessel, Otto; Hofmann, Georg; Gesell, Hartmut; and Scholz, Werner, 4,104,342, Cl. 264-12.000.

Hofmann, Ruediger; and Von Basse, Paul-Werner, to Siemens Aktiengesellschaft. Arrangement for addressing a MOS store. 4,104,735, Cl. 365-230.000.

Hogan, Lawrence Howard: *See—*
McElwain, John Christee; and Hogan, Lawrence Howard, 4,103,512, Cl. 64-17.00A.

Hohmann, Walter; Herzog, Helmut; and Bien, Hans-Samuel, to Bayer Aktiengesellschaft. Nitroanthraquinones. 4,104,284, Cl. 260-378.000.

Holdeman, John William, to Borg-Warner Corporation. Manually shiftable planetary gearset. 4,103,753, Cl. 180-49.000.

Holland, David E., to Ellanin Investments, Ltd. Method and apparatus for film weave correction. 4,104,680, Cl. 358-132.000.

Hollandse Signaalapparaten B.V.: *See—*
Nijhuis, Jan, 4,103,396, Cl. 19-66.00R.

Hollis, Darrell E.: *See—*
Hollis, Wanda L.; and Hollis, Darrell E., 4,104,695, Cl. 361-220.000.

Hollis, Wanda L.; and Hollis, Darrell E. Static electricity discharge ring. 4,104,695, Cl. 361-220.000.

Hollowell, William M.: *See—*
Tanaka, Akira; and Hollowell, William M., 4,103,967, Cl. 297-216.000.

Holt, Jan D.: *See—*
Hammonds, James C.; and Holt, Jan D., 4,103,624, Cl. 105-199.0CB.

Holt, Lloyd J.; and Panlaqui, Clayton E., to United States of America, Navy. Catapult restraint/release system. 4,103,849, Cl. 244-63.000.

Holt, William David, to Lucas Industries Limited. Diesel engine starting systems. 4,103,661, Cl. 123-179.00H.

Homberger, Rudolf Felix: *See—*
Hirmann, Georg, 4,104,425, Cl. 428-12.000.

Homeyer, Bernhard: *See—*
Arlt, Dieter; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,104,377, Cl. 424-222.000.

Homier, Robert I., to Lear Siegler, Inc. Seat recliner. 4,103,970, Cl. 297-363.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Yamazaki, Shuichi; Shimada, Shinichi; Sato, Yasuhito; and Shirakura, Hiroshi, 4,103,487, Cl. 60-282.000.

Honda, Kenji: *See—*
Tsuchida, Eishun; and Honda, Kenji, 4,104,466, Cl. 542-433.000.

Honeywell Inc.: *See—*
Lorenze, Robert V., Jr.; and White, William Joseph, 4,104,674, Cl. 357-30.000.

Honeywell Information Systems Inc.: *See—*
Steigerwald, Conrad John, 4,103,718, Cl. 140-105.000.

Honke, Heinrich: *See—*
Funke, Wilhelm; Honke, Heinrich; and Simonides, Heinz, deceased, 4,103,975, Cl. 299-43.000.

Hoof, Robert Grant, to Control Components, Inc. High energy loss disk stack testing apparatus. 4,103,534, Cl. 73-37.000.

Hoogovens Ijmuiden, B.V.: *See—*
Hoornstra, Simon, 4,103,978, Cl. 308-9.000.

Hooker, Ira D.: *See—*
Andrews, Richard E.; Hooker, Ira D.; and Simons, Daniel R., 4,103,789, Cl. 214-41.00R.

Hoornstra, Simon, to Hoogovens Ijmuiden, B.V. Liquid passage through a machine-part. 4,103,978, Cl. 308-9.000.

Hopkins, Robert E., II; and Hughes, Kathleen, to Baxter Travenol Laboratories, Inc. Photometric determination of protein, and of endotoxin with Limulus protein. 4,104,030, Cl. 23-230.00B.

Horgan, William J., Jr., to Blumcraft of Pittsburgh. Railing assembly. 4,103,874, Cl. 256-24.000.

Horn, Peter: *See—*
Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Horn, Peter, 4,104,287, Cl. 260-404.000.

Hornbaker, Edwin D.; and Nugent, Adam, Jr., to Ethyl Corporation. Treating polyvinyl chloride resins. 4,104,459, Cl. 528-499.000.

Horton, M. Duane: *See—*
Pope, Bill J.; Horton, M. Duane; and Hall, H. Tracy, 4,104,344, Cl. 264-42.000.

Hosoda, Minoru; Kasiwagi, Eiichi; Murayama, Fumio; and Isayama, Kohei, to Dai Nippon Toryo Co., Ltd. Aqueous epoxy resin paint composition. 4,104,223, Cl. 260-29.2EP.

Hosoe, Kazuya; Matsumoto, Seiichi; Hashimoto, Shigeru; Iwashita, Tomonori; Fukushima, Tadahide; and Yokota, Hideo, to Canon Kabushiki Kaisha. Sharp focus detecting system. 4,104,650, Cl. 354-25.000.

Hosoe, Kazuya; and Yokota, Hideo, to Canon Kabushiki Kaisha. Single lens reflex camera. 4,104,652, Cl. 354-25.000.

Hotchkiss, Kenneth W., to Proto Production Plastics, Inc. Terminal block cover for covering block and space between adjacent blocks. 4,104,703, Cl. 361-426.000.

Houlgrave, Robert C.; and Talafuse, Larry J., to ACF Industries, Incorporated. Actuator for expanding gate valves. 4,103,863, Cl. 251-48.000.

Hous, Pierre, to Exxon Research & Engineering Co. Stabilized halobutyl rubber. 4,104,218, Cl. 260-23.70H.

House, Ralph: *See—*
Woo, Gar Lok; and House, Ralph, 4,104,023, Cl. 8-137.000.

Housman, Joseph J., to General Atomic Company. Shock absorber. 4,104,118, Cl. 176-38.000.

Hovermarine Transport Limited: *See—*
Tattersall, Edward Gunston, 4,103,755, Cl. 180-117.000.

Howard, Edward G., Jr., to Du Pont de Nemours, E. I., and Company. Method of preparing low viscosity/inorganic filler. 4,104,243, Cl. 260-42.140.

Howard, John; and Lobley, Derek Gordon. Method of separating sulfuric acid from neutral sodium sulfate in spent chlorine dioxide generator liquor. 4,104,365, Cl. 423-531.000.

Howard, William M.: *See—*
Frederiksen, Thomas M.; Sleeth, Robert S.; and Howard, William M., 4,104,547, Cl. 307-362.000.

Howarth, John Joseph, to Measurex Corporation. Method of titrating liquor. 4,104,028, Cl. 23-230.00R.

Howerton, John M., to Phillips Petroleum Company. Temporary protection or blocking for field joint in weight coating on sea floor pipeline. 4,103,505, Cl. 61-108.000.

Hubbard, Donald Arthur, to Pont-A-Mousson S.A. Method for assembling by adhesion with synthetic resins. 4,104,354, Cl. 264-262.000.

Hubert, Peter: *See—*
Vitzthum, Otto; Hubert, Peter; and Sirtl, Wolfgang, 4,104,409, Cl. 426-386.000.

Huckin, Stuart Nicholas: *See—*
Bernstein, Edith; Chu, Daniel Tim-Wo; and Huckin, Stuart Nicholas, 4,104,306, Cl. 260-571.000.

Huebner, Charles Ferdinand, to Ciba-Geigy Corporation. 2-Piperidinoalkyl-1,4-benzodioxans. 4,104,396, Cl. 424-267.000.

Huebner, Klaus: *See—*
Boessler, Hanns; Elser, Wilhelm; Huebner, Klaus; and Ottofrickenstein, Hans, 4,104,227, Cl. 260-29.6HN.

Huertgen, Helmut B.; Larson, Walter F.; and Sibler, Guenter W., to Sutton Engineering Company. Extrusion press for direct and indirect extruding with die shifter. 4,103,529, Cl. 72-253.00A.

Huffy Corporation: *See-*
Allen, David A., 4,103,966, Cl. 297-195.000.

Hughes Aircraft Company: *See—*
Abrams, Richard L., 4,104,598, Cl. 331-94.50M.
Maeding, Dale G., 4,104,543, Cl. 307-221.00D.

Hughes, Kathleen: *See—*
Hopkins, Robert E., II; and Hughes, Kathleen, 4,104,030, Cl. 23-230.00B.

Hugin Kassaregister AB: *See—*
Lundstrom, Goran; and Nolte, Karl, 4,104,490, Cl. 200-44.000.

Humble, David Raymond; and Walters, Harry Godfrey, III, to Sensormatic Electronics Corporation. Unlatching tool for reusable security tag. 4,103,572, Cl. 81-418.000.

Hunter, Everest C., to R. E. Dietz Company. Flashing signal light. 4,104,615, Cl. 340-84.000.

Huntington, Robert G., to American Air Filter Company, Inc. Ventilated poppet damper. 4,103,708, Cl. 137-614.110.

Hupp, Stephen S.; Sabourin, Edward T.; Swift, Harold E.; and Vogel, Roger F., to Gulf Research & Development Company. Process for removing organic oxygen-containing impurities from an organic composition in the presence of steam. 4,104,318, Cl. 260-669.00A.

Hurnik, Helmut: *See—*
Ley, Kurt; Hagemann, Hermann; and Hurnik, Helmut, 4,104,195, Cl. 252-350.000.

Hush, James M.; and McPhee, Donald J., to Gates Rubber Company, The. Method and apparatus for curing and reinforcing hose. 4,104,098, Cl. 156-149.000.

Husky Corporation: *See—*
Sutcliffe, Grenville G.; Washausen, Roy F.; Tomes, William L.; and Gould, Herman Ray, 4,103,936, Cl. 285-26.000.

Hutchins, Samuel F.: *See—*
Robinson, Glen P., Jr.; Shelton, Samuel V.; and Hutchins, Samuel F., 4,103,674, Cl. 126-271.000.

Hutchison, Robert V.; Gregg, Peter P.; and MacBride, James J., to Burroughs Corporation. Heat pipe cooling for semiconductor device packaging system. 4,104,700, Cl. 361-384.000.

Huyffer, Paul S., to Polaroid Corporation. Methoxymethoxy protected intermediates for photographic dyes. 4,104,269, Cl. 260-162.000.

i. c. moller a/s: *See—*
Lambertsen, Ejvind, 4,104,582, Cl. 324-52.000.

I-T-E Imperial Corp.: *See—*
Gryctko, Carl E., 4,104,601, Cl. 335-6.000.

Ichikawa, Keiji: *See—*
Koide, Yooichi; Kaide, Tamotsu; Takada, Michio; and Ichikawa, Keiji, 4,104,073, Cl. 106-15.0FP.

Ichinose, Yasuaki: *See—*
Yokokawa, Takao; Takano, Shigeo; Ichinose, Yasuaki; Kasahara, Toshiyuki; and Ikeda, Fumiaki, 4,103,815, Cl. 228-9.000.

Ide, Hisashi: *See—*
Okuda, Hiroji; Washida, Masaaki; and Ide, Hisashi, 4,103,528, Cl. 72-238.000.

Ideal Industries, Inc.: *See—*
Scott, William J., 4,104,482, Cl. 174-87.000.

IDR, Inc.: *See—*
Saylor, Richard; Dalimonte, Alfred A.; and Nagel, Robert H., 4,104,681, Cl. 358-141.000.

Ihrman, Kryn G.: *See—*
Wollensak, John C.; Shin, Kju Hi; Ihrman, Kryn G.; and Elsey, Paul G., 4,104,255, Cl. 260-45.95C.

Iida, Kiyonobu; Tani, Yoshio; and Sugahara, Kouichi, to Kubota, Ltd. Combustion chamber for compact engine of the side valve type for universal use having contactless ignition system. 4,103,664, Cl. 123-191.00L.

Iijima, Tetsuya, to Nissan Motor Company, Ltd. Control system for an automatic power transmission. 4,103,764, Cl. 192-4.00A.

Iimura, Seiji: *See—*
Naito, Takayuki; Okumura, Jun; and Iimura, Seiji, 4,104,469, Cl. 544-27.000.

Ijlstra, Hendrik Jan; and van den Boogaard, Gerardus Joachim Maria, to Ultra Centrifuge Nederland N.V. Conductor lead-through. 4,104,484, Cl. 174-151.000.

Ikeda, Fumiaki: *See—*
Yokokawa, Takao; Takano, Shigeo; Ichinose, Yasuaki; Kasahara, Toshiyuki; and Ikeda, Fumiaki, 4,103,815, Cl. 228-9.000.

Ikeda, Hiroshi: *See—*
Inamoto, Yoshiaki; Aigami, Koji; Ohsugi, Motoyoshi; Fujikura, Yoshiaki; and Ikeda, Hiroshi, 4,104,305, Cl. 260-563.00P.

Ikeda, Richard Masayoshi: *See—*
Angelo, Rudolph John; Blomberg, Richard Nelson; Boettcher, Fritz Peter; Ikeda, Richard Masayoshi; and Samuels, Michael Robert, 4,104,438, Cl. 428-332.000.

Ikegami, Tadashi: *See—*
Kato, Yasuo; Ikegami, Tadashi; Harukawa, Junichi; and Kato, Katsuhiko, 4,104,259, Cl. 528-169.000.

Ikeura, Kenji: *See—*
Hata, Yoshitaka; Masaki, Kenji; and Ikeura, Kenji, 4,103,486, Cl. 60-274.000.

Illinois Tool Works Inc.: *See—*
Owen, Ronald C., 4,103,811, Cl. 224-45.0AA.
Pliml, Frank V.; and Erickson, Lloyd A., 4,103,854, Cl. 248-235.000.
Pliml, Frank V., Jr., 4,104,492, Cl. 200-51.140.

Imbert, Thierry F.: *See—*
Fauran, Claude P.; Turin, Michel J.; Imbert, Thierry F.; Raynaud, Guy M.; and Dorme, Nicole A. M., 4,104,384, Cl. 424-248.510.

Imperial Chemical Industries Limited: *See—*
Conbere, John P., 4,104,225, Cl. 260-29.60F.
Hall, Nigel; Price, Raymond; and Rowbotham, Philip Martin, 4,104,270, Cl. 260-205.000.
McIvor, Malcolm Charles, 4,104,579, Cl. 324-29.000.

Inaba, Toyoaki: *See—*
Takechi, Kazuo; Takahashi, Tsuyoshi; Inaba, Toyoaki; and Hasegawa, Eiichi, 4,104,125, Cl. 195-66.00R.

Inagaki, Takeo; Nakagawa, Hideki; and Isa, Hiroshi, to Lion, Fat & Oil Company, Ltd. Halogen-containing resin composition. 4,104,232, Cl. 260-31.600.

Inamoto, Yoshiaki; Aigami, Koji; Ohsugi, Motoyoshi; Fujikura, Yoshiaki; and Ikeda, Hiroshi, to Kao Soap Co., Ltd. 1-Aminotricyclo (4.3.1.1 2, 5) undecane and salts thereof. 4,104,305, Cl. 260-563.00P.

Ingersoll-Rand Company: *See—*
Law, John P., 4,103,460, Cl. 51-170.00R.

Inoue, Hiromitsu; Katayama, Susumu; and Ohashi, Hiroshi, to Matsushita Electric Works, Ltd. Ultrasonic wave horn. 4,104,610, Cl. 340-15.000.

Inoue, Hisaaki; Komai, Hisataka; and Okada, Seiichi, to Nippon Zeon Co. Ltd. Adhesive compositions. 4,104,327, Cl. 260-876.00B.

Inoue, Shizuo: *See—*
Ohashi, Yoshinobu; and Inoue, Shizuo, 4,104,347, Cl. 264-113.000.

Inoue, Takesi: *See—*
Ito, Tsuneo; Hashiba, Tatuya; Inoue, Takesi; and Nagata, Kunihiro, 4,103,406, Cl. 29-125.000.

Inoue, Yukihiro: *See—*
Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; Hashimoto, Sadakatsu; Takeda, Yoshio; Ishii, Mitsuo; and Kitanishi, Yoshitomo, 4,104,727, Cl. 364-710.000.

Inouye, Hiroshi; and Kobayashi, Sadao, to Hitachi, Ltd.; and Nippon Pillar Packing Co., Ltd. Mechanical seal. 4,103,907, Cl. 277-96.100.

Inspiration Consolidated Copper Company: *See—*
Fountain, Gerald F.; Veloz, Jaime; Bilson, Edward A.; and Cronin, John A., 4,104,157, Cl. 209-166.000.

Institut Fizicheskoi Khimii Akademii Nauk: *See—*
Fedoseev, Dmitry Valerianovich; Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; Varnin, Valentin Pavlovich; Vnukov, Stanislav Pavlovich; Gerasimenko, Valentin Korneevich; Nikitin, Jury Ivanovich; Tsypin, Nekhemyan Veniaminovich; and Hochko, Anatoly Vasilievich, 4,104,441, Cl. 428-408.000.

Institut Francais du Petrole: *See—*
Laurent, Jean, 4,103,501, Cl. 61-72.600.

Institut Sverkhtverdykh Materialov SSR: *See—*
Fedoseev, Dmitry Valerianovich; Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; Varnin, Valentin Pavlovich; Vnukov, Stanislav Pavlovich; Gerasimenko, Valentin Korneevich; Nikitin, Jury Ivanovich; Tsypin, Nekhemyan Veniaminovich; and Hochko, Anatoly Vasilievich, 4,104,441, Cl. 428-408.000.

International Business Machines Corporation: *See—*
Aichelmann, Frederick John, Jr.; Di Pilato, Nino Mario; Fehn, Thomas Peter; and Rudy, George John, 4,103,823, Cl. 235-312.000.
Anderson, Leslie C.; Nufer, Robert W.; and Pugliese, Frank G., 4,104,345, Cl. 264-43.000.
Bondur, James Allan; and Pogge, Hans Bernhard, 4,104,086, Cl. 148-1.500.
DiMaria, Donelli J.; and Young, Donald R., 4,104,675, Cl. 357-54.000.
Gadek, Thomas Richard; Sclove, David Berhard; and Vollmer, Robert Lee, 4,104,308, Cl. 260-586.00R.
Markstein, Peter Willy; and Tritter, Alan Levi, 4,104,721, Cl. 364-200.000.
Moritz, Holger; and Paal, Gabor, 4,104,070, Cl. 96-36.000.
Park, Kyu C.; and Weitzman, Elizabeth J., 4,104,418, Cl. 427-42.000.
Pogge, Hans Bernhard, 4,104,090, Cl. 148-175.000.
Schlig, Eugene Stewart; and Stilwell, George Raymond, Jr., 4,104,563, Cl. 315-169.0TV.

International Flavors & Fragrances Inc.: *See—*
Hall, John B.; and Wiegers, Wilhelmus Johannen, 4,104,203, Cl. 252-522.000.

International Paper Company: *See—*
Lowdermilk, Loren L., 4,103,471, Cl. 53-22.00B.

International Standard Electric Corporation: *See—*
Gingell, Michael J., 4,104,729, Cl. 364-757.000.
Weir, Donald A.; and Sweet, Anthony W., 4,104,488, Cl. 179-18.0FA.

International Telephone and Telegraph Corporation: *See—*
Donahue, Thomas H.; and Chaney, John F., 4,104,633, Cl. 343-7.00A.
Johnson, Charles Bruce, 4,104,568, Cl. 315-394.000.
Scherrer, Raymond E., 4,104,099, Cl. 156-155.000.

InterRoyal Corporation: *See—*
Benoit, Roland A.; and Guillot, Edmund P., 4,103,376, Cl. 5-331.000.

Iovine, Carmine P.; and Ray-Chaudhuri, Dilip K., to National Starch and Chemical Corporation. Process for preparing 2-aminoalkyl halide bisulfate salts. 4,104,307, Cl. 260-583.00G.

Ipri, Alfred C.; and Flatley, Doris W., to United States of America, Air Force. Method for fabricating MNOS memory circuits. 4,104,087, Cl. 148-1.500.

Irvine, Ronald T., to Modern Tool & Die Co., Inc. Tamperproof container and cap assembly. 4,103,803, Cl. 220-270.000.

Isa, Hiroshi: *See—*
Inagaki, Takeo; Nakagawa, Hideki; and Isa, Hiroshi, 4,104,232, Cl. 260-31.600.

Isayama, Kohei: *See—*
Hosoda, Minoru; Kasiwagi, Eiichi; Murayama, Fumio; and Isayama, Kohei, 4,104,223, Cl. 260-29.2EP.

Isbister, Eric J.; and Fidler, Horace E., to Sperry Rand Corporation. Marine radar interrogator-transponder target detection, identification, and range measurement system. 4,104,629, Cl. 343-6.00R.

Ishii, Akira: *See—*
Suzuki, Osamu; Ueda, Masaki; and Ishii, Akira, 4,104,436, Cl. 428-297.000.

Ishii, Mitsuo: *See—*
Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; Hashimoto, Sadakatsu; Takeda, Yoshio; Ishii, Mitsuo; and Kitanishi, Yoshitomo, 4,104,727, Cl. 364-710.000.

Ishii, Shozo, to Green Cross Corporation, The. Use of haptoglobin for therapy of cerebral vasospasm. 4,103,687, Cl. 128-214.00R.

Ishii, Tamotsu: *See—*
Akimoto, Yumi; Ishii, Tamotsu; Yoshizumi, Motohiko; and Haghino, Sadaaki, 4,104,549, Cl. 310-26.000.

Ishizaki, Yoshihiro. Stirling cycle machine. 4,103,491, Cl. 60-519.000.

Ismach, Aaron. Hydraulically powered hypodermic injector with adapters for reducing and increasing fluid injection force. 4,103,684, Cl. 128-173.00H.

Isshiki, Isao; and Sato, Koji, to Sumitomo Electric Industries, Ltd. Hand operated optical character recognition system. 4,104,616, Cl. 340-146.30Y.

Ithaca Gun Company, Inc.: *See—*
Tollinger, James, 4,103,586, Cl. 89-144.000.

Ito, Tadashi: *See*—
Tanaka, Katsumi; Hashimoto, Shigeru; Ohtaki, Shohei; Ito, Tadashi; Iwashita, Tomonori; and Kozuki, Susumu, 4,104,649, Cl. 354-289.000.

Ito, Tsuneo; Hashiba, Tatuya; Inoue, Takesi; and Nagata, Kunihiro, to Hitachi Metals, Ltd. Split type sectional forming roll. 4,103,406, Cl. 29-125.000.

Itoh, Takuji: *See*—
Nishikawa, Eiichiroh; Itoh, Takuji; Maeshima, Tsugio; and Kamiyama, Setsuo, 4,104,361, Cl. 423-239.000.

Iverson, Myren L., to United States of America, Navy. Wideband optical isolator. 4,104,533, Cl. 250-551.000.

Iwaeda, Toshinao: *See*—
Kido, Shiro; Saito, Yuji; and Iwaeda, Toshinao, 4,104,208, Cl. 521-53.000.

Iwanaga, Yukiya; and Kubota, Hayato, to Fuji Oil Company, Limited. Method for producing hard butter fraction from shea fat. 4,104,288, Cl. 260-412.800.

Iwashita, Tomonori: *See*—
Hosoe, Kazuya; Matsumoto, Seiichi; Hashimoto, Shigeru; Iwashita, Tomonori; Fukushima, Tadahide; and Yokota, Hideo, 4,104,650, Cl. 354-25.000.
Tanaka, Katsumi; Hashimoto, Shigeru; Ohtaki, Shohei; Ito, Tadashi; Iwashita, Tomonori; and Kozuki, Susumu, 4,104,649, Cl. 354-289.000.

Iwata, Kozo, to New Nippon Electric Co., Ltd. Magnetron operating circuit. 4,104,561, Cl. 315-101.000.

Izraeli, Hyman, to Thomas & Betts Corporation. Electrical terminal. 4,103,986, Cl. 339-272.0UC.

Izumi Denki Corporation: *See*—
Fujita, Teizo; Yoshida, Shunzo; and Koizumi, Toshio, 4,104,602, Cl. 335-61.000.

J. I. Case Company: *See*—
Baker, Donald C., 4,103,561, Cl. 74-552.000.
Flippin, James Samuel, 4,103,441, Cl. 37-86.000.

J. P. Stevens & Co., Inc.: *See*—
Latta, Bruce M.; Stevens, Catherine V.; and Dennis, Bruce E., 4,104,443, Cl. 428-474.000.

Jackson, John Charles; and Selous, Percy Bruce Gordon, to Ashlow Steel & Engineering Company Limited. Shears. 4,103,577, Cl. 83-337.000.

Jackson, Samuel G. Lint slide grid humidifier. 4,103,397, Cl. 19-66.0CC.

Jacobson, Sava. Telephone answering device with remote controlled playback. 4,104,487, Cl. 179-6.00E.

Jacobus, Nelson Mortimer, Jr., to Communications Satellite Corp. Variable sensitivity monitor circuit. 4,104,597, Cl. 330-43.000.

Jain, Prithvi: *See*—
Faber, Paul V.; Daly, Edwin R.; and Jain, Prithvi, 4,104,128, Cl. 201-4.000.

Jain, Sulekh C.; and Morris, Charles A., to Wyman-Gordon Company. Water-based forging lubricant. 4,104,178, Cl. 252-30.000.

James, Kenneth, to Tate & Lyle Limited. Purification of sucrose esters. 4,104,464, Cl. 536-115.000.

Janson, Richard W. Curtain suspension assembly. 4,103,393, Cl. 16-94.00R.

Janssen, Harald; and Hansch, Ferdinand, to Dr. Beck & Co., AG. Process for making water diluted electroinsulation enamels. 4,104,221, Cl. 260-29.20N.

Japan Synthetic Rubber Company Limited: *See*—
Arai, Kozo; Kotani, Teizo; and Mizushima, Toshio, 4,103,541, Cl. 73-88.00R.

Japanese Government: *See*—
Hirano, Taizo, 4,104,083, Cl. 136-89.00H.

Jarry, Philippe, to Le Moteur Moderne. Internal combustion engine with air reservoir. 4,103,648, Cl. 123-30.00R.

Jarvis, John R.; and Brown, Eldon W., to Ald, Inc. Adaptor for automated laundry system. 4,103,520, Cl. 68-12.00R.

Jean Walterscheid GmbH: *See*—
Grosse-Entrup, Hubert, 4,103,514, Cl. 64-23.700.

Jeanmart, Claude: *See*—
Barreau, Michel; Cotrel, Claude; and Jeanmart, Claude, 4,104,386, Cl. 424-250.000.

Jefferson, Thomas: *See*—
Carter, Walter H.; Christopher, Charles A.; and Jefferson, Thomas, 4,104,193, Cl. 252-316.000.

Jeng, Duen-Ren. Freeze-proof cap for outdoor faucet. 4,103,701, Cl. 137-375.000.

Jenney, Sherman R.: *See*—
Landry, Robert G.; and Jenney, Sherman R., 4,103,957, Cl. 296-1.00S.

Jensen, Ronald P.: *See*—
Fetz, James G.; and Jensen, Ronald P., 4,104,339, Cl. 264-1.000.

Jeppsson, Jan-Bertil: *See*—
Piltz, Lars-Eric; and Jeppsson, Jan-Bertil, 4,103,802, Cl. 220-258.000.

Jerabek, Robert D.: *See*—
Marchetti, Joseph R.; Zwack, Robert R.; and Jerabek, Robert D., 4,104,147, Cl. 204-181.00C.

Jettmar, Werner: *See*—
Kranz, Joachim; Jettmar, Werner; and Polster, Rudolf, 4,104,276, Cl. 260-314.500.

Jeumont-Schneider: *See*—
Salmon, Jean P., 4,103,851, Cl. 246-63.00C.

Jewell, William R. Automatic electric power switch. 4,104,541, Cl. 307-141.000.

Joekel, Alfred, to Balcke-Durr Aktiengesellschaft. Method for the cold working of heat exchanger tubing for the attachment of spiral fins. 4,103,408, Cl. 29-157.3AH.

Joerns Furniture Company, Division of American Seating Company: *See*—
Damico, Frank M.; and O'Toole, Patrick John, 4,104,710, Cl. 362-130.000.

Johansen, Jon W.: *See*—
Bednorz, Klaus; Johansen, Jon W.; and Scheidel, Fritz, 4,104,676, Cl. 357-79.000.

John Sterling Corporation: *See*—
Sterling, John R., 4,103,781, Cl. 211-86.000.

Johns-Manville Corporation: *See*—
Byrd, Carlisle O., Jr., 4,103,469, Cl. 52-509.000.

Johnson, Anthony E.: *See*—
Barnerias, Jean; Johnson, Anthony E.; and Weimar, Erich, 4,103,459, Cl. 49-491.000.

Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Scanning shutter blade arrangement with ambient and flash ranges. 4,104,653, Cl. 354-27.000.

Johnson, Carl A., to Owens-Corning Fiberglas Corporation. Sizing composition and glass fibers sized therewith. 4,104,434, Cl. 428-273.000.

Johnson, Charles Bruce, to International Telephone & Telegraph Corporation. Scan-converter tube system. 4,104,568, Cl. 315-394.000.

Johnson, Herbert G. Solid-phase conversion of particulate metal into continuous strip. 4,104,060, Cl. 75-208.0CS.

Johnson, Lawrence D., to Keystone Consolidated Industries, Inc. Self-tapping or thread-forming screw. 4,104,446, Cl. 428-585.000.

Johnson, Raymond G., Jr.; Cotton, Lou S.; and Verzella, David J., to United Technologies Corporation. Variable incidence helicopter stabilator and fail safe actuator. 4,103,848, Cl. 244-17.130.

Johnson, Theodore W.: *See*—
Maher, John P.; and Johnson, Theodore W., 4,104,421, Cl. 427-96.000.

Johnston, Charles Richard; and MacGregor, James G., to Consolidated Energy Products Co. Convertible boat-utility trailer. 4,103,926, Cl. 280-414.00R.

Jolliff, Norman E.: *See*—
von Kaler, Roland L.; and Jolliff, Norman E., 4,103,566, Cl. 74-701.000.

Jones, Giffin D., to Dow Chemical Company, The. Filled thermoplastic resin compositions. 4,104,289, Cl. 260-42.410.

Jones, John H.; Schoenleber, Donald W.; and Grainger, Frederick, to Beatrice Foods Co. Flap pop-up for advertising leaflets. 4,103,444, Cl. 40-124.100.

Jones & Laughlin Steel Corporation: *See*—
Batz, Walter, 4,104,088, Cl. 148-12.00R.

Jones, Ray A.: *See*—
Deutsch, Joseph Paul; and Jones, Ray A., 4,104,356, Cl. 264-297.000.

Jones, William H.; and Astrom, Gordon L., to Eaton Corporation. Pressure switch and actuating means responsive to low pressure. 4,104,495, Cl. 200-83.00P.

Jones, William Kinzy, to United States of America, Navy. Zero temperature coefficient of resistance bi-film resistor. 4,104,607, Cl. 338-309.000.

Jordan, John F.; and Lampkin, Curtis, to Photon Power, Inc. Photovoltaic cell. 4,104,420, Cl. 427-74.000.

Jordt, Alfred: *See*—
Erich, Hans; Jordt, Alfred; and Konig, Klaus, 4,103,759, Cl. 184-64.000.

Jorgensen, Morell L., to Stone Conveyor, Inc. (Entire). Live roller conveyor. 4,103,769, Cl. 198-781.000.

Josis, Christian Rubens, to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Desorption of volatile compounds dissolved in a liquid phase. 4,104,038, Cl. 55-19.000.

Judy, Kenneth W. M.: *See*—
Weiss, Charles M.; and Judy, Kenneth W. M., 4,103,422, Cl. 32-10.00A.

Juels, Ronald J.: *See*—
Melling, Norman D.; De Matteo, John J.; Levrant, Melvyn A.; and Juels, Ronald J., 4,104,608, Cl. 340-3.0PS.

Juhasz, Josef, to Robert Bosch GmbH. Storage battery test apparatus to determine remaining stored charge therein. 4,104,580, Cl. 324-29.500.

Juhasz, Joseph Laszlo: *See*—
Frost, Richard Butler; Juhasz, Joseph Laszlo; and Wing, Barry Walter, 4,103,809, Cl. 224-5.00R.

Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; and Mages, Bernhard, 4,103,394, Cl. 16-129.000.

Jumberca S.A.: *See*—
Lombardi, Victor J.; and Dalmau, José Ma (José Ma Dalmau, a part interest assors. to), 4,103,518, Cl 66-107.000.

Junkermann, Helmut; and Schwab, Heinrich, to Deutsche Gold- und Silber-Scheideanstalt vormals Koessler. Process for detoxification of formaldehyde containing waste waters. 4,104,162, Cl. 210-63.00R.

Jurgensen, Robert H.: *See*—
Rayfield, Wilson Parker; and Jurgensen, Robert H., 4,104,105, Cl. 156-364.000.

K-Line Industries, Inc.: *See*—
Kammeraad, James A., 4,103,662, Cl. 123-188.0GC.

Kabushiki Kaisha Pollution Preventing Research Laboratory: *See*—
Ando, Wataru; and Nakaoka, Ichiro, 4,104,145, Cl. 204-162.00R.

Kaeding, Warren W., to Mobil Oil Corporation. Ethylation of mono alkyl benzene. 4,104,319, Cl. 260-671.00C.

Kafunek, Pavel: *See*—
Kovar, Jiri; Kafunek, Pavel; Reichel, Pavel; Pokorny, Oldrich; Pellant, Michal; Kratina, Jindrich; and Zuna, Jaroslav, 4,104,677, Cl. 357-81.000.

Kaide, Tamotsu: *See*—
Koide, Yooichi; Kaide, Tamotsu; Takada, Michio; and Ichikawa, Keiji, 4,104,073, Cl. 106-15.0FP.

Kainmuller, Thomas: *See*—
Buxbaum, Lothar; Kainmuller, Thomas; and Habermeier, Jurgen, 4,104,297, Cl. 528-289.000.

Kaiser Aluminum & Chemical Corporation: *See*—
Roberts, Sidney G., 4,104,061, Cl. 75-211.000.

Kakumae, Masaru: *See*—
Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; Hashimoto, Sadakatsu; Takeda, Yoshio; Ishii, Mitsuo; and Kitanishi, Yoshitomo, 4,104,727, Cl. 364-710.000.

Kalden, Adrianus B., to Shell Oil Company. Suppressing constant frequency noise in seismic records. 4,104,611, Cl. 340-15.50F.

Kamiya, Minoru. Lever tumbler lock device having variable ward patterns. 4,103,525, Cl. 70-347.000.

Kamiyama, Setsuo: *See*—
Nishikawa, Eiichiroh; Itoh, Takuji; Maeshima, Tsugio; and Kamiyama Setsuo, 4,104,361, Cl. 423-239.000.

Kammeraad, James A., to K-Line Industries, Inc. Insert for rebuilding valve guides. 4,103,662, Cl. 123-188.0GC.

Kampman, Lester R.; Ulrich, James K.; and Hodgson, James H., to Chromalloy American Corporation. Apparatus for forming a bale of hay. 4,103,475, Cl. 56-16.400.

Kamyr, Inc.: *See*—
Sherman, Michael I.; and Prough, James R., 4,104,113, Cl. 162-19.000.

Kanai, Masakuni. Method of separation of fluoride ion from water. 4,104,159, Cl. 210-28.000.

Kanazawa, Yukio: *See*—
Sudo, Katsumi; and Kanazawa, Yukio, 4,104,692, Cl. 361-106.000.

Kaneko, Masayoshi: *See*—
Tokuno, Masateru; Tanigawa, Hisahiro; Kaneko, Masayoshi; and Shinmura, Noboru, 4,104,723, Cl. 364-475.000.

Kaneko, Tsugio: *See*—
Minagawa, Yukinori; Kaneko, Tsugio; Yajima, Fumikazu; Yamaguchi, Kunihiko; and Yoshitomi, Toshihiko, 4,104,358, Cl. 423-21.000.

Kangol Magnet Limited: *See*—
Ashworth, Roger Anderton; Pollitt, John Michael; and White, Graham Colin, 4,103,754, Cl. 180-82.00C.

Kao Soap Co., Ltd.: *See*—
Inamoto, Yoshiaki; Aigami, Koji; Ohsugi, Motoyoshi; Fujikura, Yoshiaki; and Ikeda, Hiroshi, 4,104,305, Cl. 260-563.00P.

Karacan, Ismet; Paulson, Larry G.; and Timm, Gerald W., to American Medical Systems, Inc. Nocturnal penile tumescense monitor. 4,103,678, Cl. 128-2.05V.

Kardos, Otto: *See*—
Lash, Ronald J.; and Kardos, Otto, 4,104,137, Cl. 204-43.00T.
Passal, Frank; Lash, Ronald J.; and Kardos, Otto, 4,104,138, Cl. 204-44.000.

Karklys, Joseph; and Yamanaka, Junji Cary, to Whirlpool Corporation. Program modification circuit for electronic appliance programmer. 4,104,542, Cl. 307-141.000.

Kasahara, Toshiyuki: *See*—
Yokokawa, Takao; Takano, Shigeo; Ichinose, Yasuaki; Kasahara, Toshiyuki; and Ikeda, Fumiaki, 4,103,815, Cl. 228-9.000.

Kasiwagi, Eiichi: *See*—
Hosoda, Minoru; Kasiwagi, Eiichi; Murayama, Fumio; and Isayama, Kohei, 4,104,223, Cl. 260-29.2EP.

Kasten, Gary L.: *See*—
Laudemann, Ronald L.; and Kasten, Gary L., 4,103,831, Cl. 214-1.0HA.

Kastner, Karl F. Grease extraction cartridge for kitchen exhaust ventilator. 4,103,676, Cl. 126-299.00E.

Kasubuchi, Takeshi, to Sharp Kabushiki Kaisha. Electronic apparatus equipped on a flexible substratum. 4,104,728, Cl. 364-712.000.

Katayama, Susumu: *See*—
Inoue, Hiromitsu; Katayama, Susumu; and Ohashi, Hiroshi, 4,104,610, Cl. 340-15.000.

Kato, Katsuhiko: *See*—
Kato, Yasuo; Ikegami, Tadashi; Harukawa, Junichi; and Kato, Katsuhiko, 4,104,259, Cl. 528-169.000.

Kato, Koich; and Murata, Saburo, to Mitsubishi Petrochemical Co., Ltd. Method for stabilizing an olefin polymer. 4,104,247, Cl. 260-45.70R.

Kato, Makoto: *See*—
Satoh, Isao; and Kato, Makoto, 4,104,489, Cl. 179-100.30G.

Kato, Tetsuo; and Mori, Kazumasa, to Nippondenso Co., Ltd. Lighting system for a motor vehicle. 4,104,560, Cl. 315-83.000.

Kato, Yasuo; Ikegami, Tadashi; Harukawa, Junichi; and Kato, Katsuhiko, to Toyo Boseki Kabushiki Kaisha. Fireproof polyesters from brominated dihydroxy alkoxy-diphenyl sulfones. 4,104,259, Cl. 528-169.000.

Katsuragi, Masao: *See*—
Kobayashi, Kazuaki; Takaha, Noboru; and Katsuragi, Masao, 4,104,077, Cl. 106-88.000.

Kauer, James Charles, to Du Pont de Nemours, E. I., and Company. Heteroaryl crown ethers. 4,104,275, Cl. 260-297.00B.

Kaufer, Leo. Chemical dispenser for urinals. 4,103,367, Cl. 4-222.000.

Kawada, Chikao; and Tsuchikura, Toshio, to Chikao Kawada. Doll with neck detachably secured between opposed baby means portions. 4,103,451, Cl. 46-22.000.

Kawaguchi, Taizo: *See*—
Yamazaki, Yasuo; Kawaguchi, Taizo; and Kimura, Kazuo, 4,104,663, Cl. 354-197.000.

Kawaii Musical Instrument Mfg. Co.: *See*—
Deutsch, Ralph, 4,103,581, Cl. 84-1.240.

Kawasaki Steel Corporation: *See*—
Fujimaki, Taketoshi; Shijima, Shoji; and Harada, Shunichi, 4,104,135, Cl. 204-37.00T.

Kawashima, Yoshiro. Cloth article transporters. 4,103,884, Cl. 271-18.300.

Keene, David Edward; and Douglas, Anthony Frederick, to British Gas Corporation. Sealants. 4,104,211, Cl. 260-8.000.

Kehl, William L.: *See*—
Cronauer, Donald C.; and Kehl, William L., 4,104,200, Cl. 252-465.000.

Keiper K.G.: *See*—
Klingelhofer, Friedrich; and Wagener, Heinz-Jurgen, 4,103,964, Cl. 297-367.000.

Kelly, Eugene R.; and Gould, Donald M., to Product Design & Engineering Corp. Tampon ejector tube and apparatus. 4,104,013, Cl. 425-324.100.

Kelly, James B.: *See*—
Beckmann, Peter V.; and Kelly, James B., 4,103,544, Cl. 73-115.000.

Kem, Kenneth M.: *See*—
Meyer, Victor E.; and Kem, Kenneth M., 4,104,228, Cl. 260-29.6NR.

Kendall, Don L.; Ahlburn, Byron T.; and Wiemer, Klaus C., to Texas Instruments Incorporated. Discrete, fixed-value capacitor. 4,104,697, Cl. 361-305.000.

Kenney, James F., to M&T Chemicals Inc. Process for producing film and fiber-forming polyalkylene terephthalate. 4,104,263, Cl. 528-279.000.

Keppler, Hans Georg; Sander, Bruno; Moeller, Rolf; Bonitz, Eckhard; and Simmler, Werner, to BASF Aktiengesellschaft. Utilization of constituents of effluent from the manufacture of styrene bead polymers in the manufacture of fibrids. 4,104,341, Cl. 264-9.000.

Kersten, Ralf, to Siemens Aktiengesellschaft. Device for connecting two groups of glass fibers. 4,103,987, Cl. 350-96.210.

Kessel, Stanley P. Orthodontic bracket. 4,103,423, Cl. 32-14.00A.

Kewanee Industries: *See*—
Weiss, Marvin; Adams, Phillip; Nass, Gerald I.; and Leitner, Roland L., 4,104,144, Cl. 204-159.230.

Key Industries: *See*—
Pearce, Arthur R., 4,104,014, Cl. 425-345.000.

Keystone Consolidated Industries, Inc.: *See*—
Johnson, Lawrence D., 4,104,446, Cl. 428-585.000.
Keyworth, Donald A.: *See*—
Sudduth, Jerome R.; and Keyworth, Donald A., 4,104,146, Cl. 204-165.000.
Kido, Shiro; Saito, Yuji; and Iwaeda, Toshinao, to Toyo Soda Manufacturing Co., Ltd. Process for preparation of hard and porous polyvinylalcohol gels. 4,104,208, Cl. 521-53.000.
Kiely, William L.; and Pedersen, Kristen I., to Sotec, Inc. Seal for submersible pipe swivel. 4,103,942, Cl. 285-276.000.
Kierstead, Richard Wightman: *See*—
Gallo-Torres, Hugo; Guthrie, Robert William; Hamilton, James Guthrie; Kierstead, Richard Wightman; and Sullivan, Ann Clare, 4,104,285, Cl. 260-397.100.
Kiesow, Herbert L. Safety sensor device. 4,103,697, Cl. 137-45.000.
Kikumoto, Ryoji: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,104,392, Cl. 424-258.000.
Kikura, Katsuaki: *See*—
Shimoji, Masaharu; Tatsutomi, Yasuo; Hirose, Yutaka; Yamasaki, Atsumichi; and Kikura, Katsuaki, 4,103,666, Cl. 123-219.000.
Kilbourn, Thomas S.: *See*—
Rayment, Larry W.; and Kilbourn, Thomas S., 4,104,505, Cl. 219-76.160.
Kimoto, Sigeru: *See*—
Yoshikawa, Yoshio; Amemiya, Akira; Kimoto, Sigeru; and Kimpara, Hidenori, 4,104,192, Cl. 252-188.000.
Kimpara, Hidenori: *See*—
Yoshikawa, Yoshio; Amemiya, Akira; Kimoto, Sigeru; and Kimpara, Hidenori, 4,104,192, Cl. 252-188.000.
Kimura, Kazuo: *See*—
Yamazaki, Yasuo; Kawaguchi, Taizo; and Kimura, Kazuo, 4,104,663, Cl. 354-197.000.
King, Arthur Shelley. Suspended solids extraction system and method. 4,104,142, Cl. 204-152.000.
King, Derek Anthony: *See*—
Prouse, Ronald Ernest; West, Anthony Alfred; King, Derek Anthony; and Poulson, Roger, 4,104,115, Cl. 162-100.000.
Kinoshita Seiki Kabushiki Kaisha: *See*—
Abe, Michio, 4,103,725, Cl. 151-35.000.
Kiripolszki, Michael: *See*—
Trauner, Gerhard; and Kiripolszki, Michael, 4,104,640, Cl. 343-765.000.
Kirk, James P.; and Wear, Robert L., to Minnesota Mining and Manufacturing Company. Flame retardant, non-dripping coating composition comprising crosslinkable copolymers of dihydric phenols with bis chloroalkyl oxetanes. 4,104,433, Cl. 428-245.000.
Kishida, Shizuaki; and Takahashi, Misao, to Sanyei Corporation. Plastic bag forming and sealing apparatus. 4,104,108, Cl. 156-510.000.
Kiss, Sandor G. Sludge settling and de-watering apparatus. 4,104,168, Cl. 210-297.000.
Kissick, Thomas P.: *See*—
Wade, Peter C.; and Kissick, Thomas P., 4,104,387, Cl. 424-250.000.
Wade, Peter C.; and Kissick, Thomas P., 4,104,388, Cl. 424-250.000.
Kitagawa, Masahiro: *See*—
Maitani, Yoshihisa; Shimoyama, Kunio; Yoshida, Muneaki; Hashimoto, Akihiko; and Kitagawa, Masahiro, 4,104,654, Cl. 354-31.000.
Kitamura, Yoshinori; and Nakabe, Ryuhei, to Matsushita Electric Industrial Co., Ltd. Color error suppression apparatus and method. 4,104,679, Cl. 358-44.000.
Kitanishi, Yoshitomo: *See*—
Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; Hashimoto, Sadakatsu; Takeda, Yoshio; Ishii, Mitsuo; and Kitanishi, Yoshitomo, 4,104,727, Cl. 364-710.000.
Kitzing, Rainer: *See*—
Smith, Norman Alfred; and Kitzing, Rainer, 4,104,302, Cl. 260-561.00S.
Kizu, Yasuo: *See*—
Tsubuko, Kazuo; and Kizu, Yasuo, 4,104,183, Cl. 252-62.10L.
Klassen, Fritz E. Lamp socket for use with multi-level bulb and nightlight. 4,104,565, Cl. 315-178.000.
Klatt, Kenneth G.; and Robnolt, Leon D., Jr., to Rexnord Inc. Detecting resin cure. 4,103,771, Cl. 206-219.000.
Klauke, Erich: *See*—
Rohe, Lothar; Schramm, Jurgen; Klauke, Erich; Eue, Ludwig; and Schmidt, Robert Rudolf, 4,104,313, Cl. 260-612.00R.
Klein, Schanzlin & Becker AG: *See*—
Blank, Wilhelm; and Roth, Ernst, 4,104,551, Cl. 310-88.000.
Klemann, Lawrence P.; and Newman, Gerald H., to Exxon Research & Engineering Co. Alkali metal anode/chalcogenide cathode reversible batteries having alkali metal polyaryl metallic compound electrolytes. 4,104,451, Cl. 429-194.000.
Klemann, Lawrence P.: *See*—
Whitney, Thomas A.; and Klemann, Lawrence P., 4,104,450, Cl. 429-194.000.
Klingelhofer, Friedrich; and Wagener, Heinz-Jurgen, to Keiper K.G. Adjustable hinge assembly for seat of two-door motor vehicle. 4,103,964, Cl. 297-367.000.
Klocke, Helmut: *See*—
Vanheerentals, Jacques Leon; Pfeifer, Josef; Klocke, Helmut; and Paulus, Rudolf, 4,104,069, Cl. 96-23.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Prasch, Johann, 4,103,665, Cl. 123-196.00R.
Kloots, Jacobus, to Applied Fiberoptics, Inc. Surgeons headlight with continuously variable spot size. 4,104,709, Cl. 362-105.000.
Klosowski, Jerome M.; and Romig, Charles A., to Dow Corning Corporation. Methylsilacyclopentenyl-containing silylating agents and method therefor. 4,104,295, Cl. 260-448.20N.
Kmec, Joseph F.: *See*—
Desmond, John W.; Kmec, Joseph F.; and Meyer, Charles A., 4,103,905, Cl. 277-56.000.
Knapp, Walter: *See*—
Fergg, Berthold; Knapp, Walter; and Zahn, Wolfgang, 4,103,996, Cl. 355-32.000.
Knoke, Silas J., to Lear Siegler, Inc. Bed frame leg construction. 4,103,374, Cl. 5-176.00R.
Knorr-Bremse GmbH: *See*—
Pick, Peter, 4,103,976, Cl. 303-38.000.
Kobayashi, Akihiro: *See*—
Hibino, Yoshihiro; Sasaya, Hideaki; and Kobayashi, Akihiro, 4,104,493, Cl. 200-61.45R.
Kobayashi, Kazuaki; Takaha, Noboru; and Katsuragi, Masao, to Yokohama Rubber Co., Ltd., The; Nihon Cement Co., Ltd.; and Asano Pole Co., Ltd. Porous inorganic product. 4,104,077, Cl. 106-88.000.
Kobayashi, Osamu; Nakamura, Ikuo; and Shimozono, Akira, to Nissan Motor Company, Limited. Seal structures for rotary regenerative heat exchangers of gas turbine engines. 4,103,908, Cl. 277-96.200.
Kobayashi, Sadao: *See*—
Inouye, Hiroshi; and Kobayashi, Sadao, 4,103,907, Cl. 277-96.100.
Kobayashi, Shoichi: *See*—
Ueshima, Takashi; Tanaka, Yasuzi, Yokoyama, Toshiro; and Kobayashi, Shoichi, 4,104,325, Cl. 260-876.00R.
Kobe, Inc.: *See*—
Erickson, John W., 4,103,749, Cl. 175-70.000.
Kochanowski, John Edward; and Wambach, Allen Dale, to General Electric Company. Reinforced thermoplastic polyester compositions having improved high voltage breakdown resistance. 4,104,242, Cl. 260-40.00R.
Kochanowsky, Boris J. Open pit mine. 4,103,972, Cl. 299-18.000.
Koehler, Charles E.: *See*—
Curtiss, John N.; Koehler, Charles E.; and Murray, Pat L., 4,104,346, Cl. 264-51.000.
Koehler, Karlheinz: *See*—
Aichinger, Horst; Kranberg, Heinz-Erik; and Koehler, Karlheinz, 4,104,524, Cl. 250-402.000.
Koenig, Karl-Heinz; and Hamprecht, Gerhard, to BASF Aktiengesellschaft. Manufacture of sulfamic acid halides. 4,104,298, Cl. 260-543.00R.
Koernig, Wolfgang: *See*—
Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Horn, Peter, 4,104,287, Cl. 260-404.000.
Koh-I-Noor Rapidograph, Inc.: *See*—
Anderka, Gerold, 4,103,999, Cl. 401-134.000.
Kohler, Ramon C., to Caterpillar Tractor Co. Detented manual actuator for a multifunction system. 4,103,559, Cl. 74-471.0XY.
Koide, Yooichi; Kaide, Tamotsu; Takada, Michio; and Ichikawa, Keiji, to Dainichi-Nippon Cables, Ltd. Fire retardant intumescent putty. 4,104,073, Cl. 106-15.0FP.
Koike, Hiroshi; Wakayama, Hideaki; Ohashi, Hiroshi; and Yokokura, Kunio, to Tokyo Shibaura Electric Co., Ltd. Vacuum interrupter device. 4,104,496, Cl. 200-144.00B.
Koizumi, Toshio: *See*—
Fujita, Teizo; Yoshida, Shunzo; and Koizumi, Toshio, 4,104,602, Cl. 335-61.000.
Kojo, Takeshi: *See*—
Miyai, Yukio; Kojo, Takeshi; Takahashi, Junichi; Yoshioka, Satoshi; Nakamichi, Kensuke; Okada, Kozo; and Takeda, Setsuko, 4,104,584, Cl. 324-58.50R.
Kokiso, Masakazu: *See*—
Tarumi, Noriyoshi; Tamura, Akihiko; and Kokiso, Masakazu, 4,104,065, Cl. 96-1.50R.
Kokot, Hellmut: *See*—
Romey, Ingo; Kolling, Georg; and Kokot, Hellmut, 4,104,150, Cl. 208-91.000.

Kolbeck, Rainer; Kuckenburg, Heinz; and Schaffernicht, Klaus, to Licentia Patent-Verwaltungs-G.m.b.H. Electron beam producing arrangement for a cathode ray tube. 4,104,554, Cl. 313-447.000.

Kolling, Georg: *See—*
Romey, Ingo; Kolling, Georg; and Kokot, Hellmut, 4,104,150, Cl. 208-91.000.

Komai, Hisataka: *See—*
Inoue, Hisaaki; Komai, Hisataka; and Okada, Seiichi, 4,104,327, Cl. 260-876.00B.

Komiya, Yoshio: *See—*
Uchiyama, Takashi; Sanada, Noriaki; Otaka, Teruo; Komiya, Yoshio; Okuno, Youichi; and Yokota, Hideo, 4,104,658, Cl. 354-106.000.

Konig, Klaus: *See—*
Erich, Hans; Jordt, Alfred; and Konig, Klaus, 4,103,759, Cl. 184-64.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Tarumi, Noriyoshi; Tamura, Akihiko; and Kokiso, Masakazu, 4,104,065, Cl. 96-1.50R.

Konnemann, Alfred, to Grote & Hartmann GmbH & Co KG. Electrical current distributing arrangement. 4,104,699, Cl. 361-349.000.

Kono, Kimio: *See—*
Goshima, Takeshi; Sugiura, Yoshinori; Endo, Kiyonobu; Sato, Hideaki; and Kono, Kimio, 4,104,573, Cl. 318-640.000.

Koppers Company, Inc.: *See—*
Christensen, Kenneth Kaae, 4,104,107, Cl. 156-473.000.

Korff, Phillip B.: *See—*
Chu, Wesley W.; and Korff, Phillip B., 4,104,719, Cl. 364-200.000.

Korpela, Thomas J.: *See—*
Caprioti, Alfred J.; Gana, John; and Korpela, Thomas J., 4,103,903, Cl. 277-27.000.

Koskimies, Ouni, to Valmet Oy. Headbox flow controls. 4,104,116, Cl. 162-343.000.

Koslowsky, Ladislav, to H.L.S. Ltd., Industrial Engineering Company. Process for separating oils and fats into liquid and solid fractions. 4,104,290, Cl. 260-428.500.

Kosogov, Evgeny Efremovich: *See—*
Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.

Kotani, Teizo: *See—*
Arai, Kozo; Kotani, Teizo; and Mizushima, Toshio, 4,103,541, Cl. 73-88.00R.

Kovar, Jiri; Kafunek, Pavel; Reichel, Pavel; Pokorny, Oldrich; Pellant, Michal; Kratina, Jindrich; and Zuna, Jaroslav, to CKD Praha, oborovy podnik. Arrangement for adjustably urging a semi-conductive element against a heat sink. 4,104,677, Cl. 357-81.000.

Kovitch, Frank J.: *See—*
Herbert, John T.; Kovitch, Frank J.; and Sullivan, Paul E., 4,103,939, Cl. 285-137.00A.

Koyama, Mitsuo: *See—*
Tadashi, Nakagawa; Watanabe, Masanori; Onda, Eiichi; Koyama, Mitsuo; and Nemoto, Ichiro, 4,104,665, Cl. 354-226.000.

Koyo Seiko Company, Limited: *See—*
Okuda, Hiroji; Washida, Masaaki; and Ide, Hisashi, 4,103,528, Cl. 72-238.000.

Kozuki, Susumu: *See—*
Tanaka, Katsumi; Hashimoto, Shigeru; Ohtaki, Shohei; Ito, Tadashi; Iwashita, Tomonori; and Kozuki, Susumu, 4,104,649, Cl. 354-289.000.

Krafft, Werner; Arnold, Gunther; Paal, Gabor; and Vollmer, Hans-Peter, to AGFA-Gevaert, AG. Polymer binder. 4,104,067, Cl. 96-1.50R.

Kraftwerk Union Aktiengesellschaft: *See—*
Schilling, Rainer, 4,104,119, Cl. 176-38.000.

Kramer, Charles J., to Xerox Corporation. Optical system for scanning during reciprocal motion providing 180° rotation of image. 4,103,991, Cl. 350-297.000.

Krammer, Franz: *See—*
Peters, Victor; and Krammer, Franz, 4,104,219, Cl. 260-29.6RB.

Krampitz, Horst: *See—*
Hertwig, Askan; and Krampitz, Horst, 4,104,189, Cl. 252-186.000.

Kranberg, Heinz-Erik: *See—*
Aichinger, Horst; Kranberg, Heinz-Erik; and Koehler, Karlheinz, 4,104,524, Cl. 250-402.000.

Kranz, Joachim; Jettmar, Werner; and Polster, Rudolf, to BASF Aktiengesellschaft. Conversion of crude copper phthalocyanines to a pigmentary form. 4,104,276, Cl. 260-314.500.

Kratina, Jindrich: *See—*
Kovar, Jiri; Kafunek, Pavel; Reichel, Pavel; Pokorny, Oldrich; Pellant, Michal; Kratina, Jindrich; and Zuna, Jaroslav, 4,104,677, Cl. 357-81.000.

Krause, Herbert: *See—*
Giebel, Wolfgang; and Krause, Herbert, 4,103,911, Cl. 277-210.000.

Krausz, Francois, to C M Industries. Derivatives of phenylpropenylamine. 4,104,383, Cl. 424-248.400.

Krautkramer-Branson, Incorporated: *See—*
Dallas, Gary S.; and Pittaro, Richard J., 4,104,545, Cl. 307-351.000.

Kren, George J.: *See—*
Wheeler, William R.; Kren, George J.; and Urbanek, Karel, 4,103,542, Cl. 73-105.000.

Kress elektrik GmbH & Co., Firma: *See—*
Kress, Willy; and Seifert, Josef, 4,103,511, Cl. 64-4.000.

Kress, Willy; and Seifert, Josef, to Kress elektrik GmbH & Co., Firma. Connecting arrangement for a machine tool. 4,103,511, Cl. 64-4.000.

Krieger, George H., to St. Louis Diecasting Corporation. Method of making a foam filled die cast bat. 4,103,412, Cl. 29-460.000.

Krob, Erwin; Weigl, Erwin; and Svoboda, Josef, to TMC Corporation. Brake device for skis. 4,103,916, Cl. 280-605.000.

Krolak, Ronald F.; and Radloff, Frederick J., to Bunker Ramo Corporation. Connector adapter constructions with improved connection and connector mounting arrangement. 4,103,985, Cl. 339-126.00R.

Krueger, Helmut H. A.: *See—*
Tisone, Thomas C.; Krueger, Helmut H. A.; Sobecks, Ronald S.; and Tauber, Richard N., 4,104,507, Cl. 219-513.000.

Kruger, Heiko: *See—*
Schachinger, Martin; and Kruger, Heiko, 4,104,518, Cl. 250-221.000.

Krupnick, Albert C.: *See—*
Roberts, Marion L.; Sharpe, Max H.; and Krupnick, Albert C., 4,104,134, Cl. 204-37.00R.

Kubin, Miroslav: *See—*
Vozka, Stanislav; Spacek, Pavel; and Kubin, Miroslav, 4,104,363, Cl. 423-338.000.

Kubota, Hayato: *See—*
Iwanaga, Yukiya; and Kubota, Hayato, 4,104,288, Cl. 260-412.800.

Kubota, Ltd.: *See—*
Iida, Kiyonobu; Tani, Yoshio; and Sugahara, Kouichi, 4,103,664, Cl. 123-191.00L.
Nishida, Tsuyoshi; Tabushe, Satoshi; and Akeda, Kouichi, 4,103,650, Cl. 123-41.860.
Ohashi, Yoshinobu; and Inoue, Shizuo, 4,104,347, Cl. 264-113.000.

Kuckenburg, Heinz: *See—*
Kolbeck, Rainer; Kuckenburg, Heinz; and Schaffernicht, Klaus, 4,104,554, Cl. 313-447.000.

Kuhn, Earl C., to Westinghouse Electric Corp. Thrust bearing assembly. 4,103,979, Cl. 308-160.000.

Kumazawa, Toshiharu, to Mitsubishi Precision Co., Ltd. Method of and apparatus for generating mixed and atomized fluids. 4,103,827, Cl. 239-8.000.

Kumpula, Clyde A.: *See—*
Charnley, Ralph L.; and Kumpula, Clyde A., 4,104,670, Cl. 354-324.000.

Kupper, Willi, to W. Schlafhorst & Co. Undoing or removing the thread ends of textile bobbins. 4,103,836, Cl. 242-35.60E.

Kuri Chemical Engineers, Incorporated: *See—*
Kuri, Setuya; and Fuwa, Sinji, 4,104,039, Cl. 55-23.000.

Kuri, Setuya; and Fuwa, Sinji, to Kuri Chemical Engineers, Incorporated; and Chlorine Engineers Corp. Process for concentrating or liquefying a specified component of a gaseous mixture. 4,104,039, Cl. 55-23.000.

Kutuzov, Boris Nikolaevich: *See—*
Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and Deeva, Alexandra Ivanovna, administratrix, 4,103,745, Cl. 173-57.000.

L. & C. Steinmuller GmbH: *See—*
Dorling, Rolf; and Westebbe, Klaus, 4,103,647, Cl. 122-483.000.

L.E. Sauer Machine Co.: *See—*
Sauer, Louis E.; and Miller, Orville C., 4,103,580, Cl. 83-663.000.

Laar, Erwin, to AGFA-Gevaert, AG. Continuous processor for photographic films or the like. 4,104,668, Cl. 354-299.000.

Labatt Breweries of Canada Limited: *See—*
Richardson, Bruce E.; and Oetliker, Rudy, 4,103,698, Cl. 134-73.000.

Labaw, Clifford Steven; Webb, Robert Lee; and Wellman, George

Robert, to SmithKline Corporation. Imidazolemethylphosphonium salts. 4,104,472, Cl. 548-337.000.

Labit, Sidney James; and Furmaga, Robert Edwin, to Baker International Corporation. Time cycle controller for pneumatic valve. 4,103,710, Cl. 137-624.130.

Laboratoire Suisse de Recherches Horlogeries: *See—*
Gass, Hans; Hintermann, Hans Erich; and Griepentrog, Hartmut, 4,104,096, Cl. 156-89.000.

Lach, Robert E.: *See—*
Loofbourow, Donald I.; and Lach, Robert E., 4,103,846, Cl. 242-205.000.

Lachance, Gilles Raoul. Portable animal sanitary device. 4,103,953, Cl. 294-19.00R.

Lada, Arnold; and Middleton, James J., to Millmaster Onyx Corporation. Composition and method for protecting skin and hair. 4,104,368, Cl. 424-60.000.

Lagarde, Robert: *See—*
Bargain, Michel; and Lagarde, Robert, 4,104,239, Cl. 260-37.0SB.

Lahr, Roy J.: *See—*
Thornburg, David D.; and Lahr, Roy J., 4,104,515, Cl. 235-488.000.

Lai, John Ta-Yuan, to B. F. Goodrich Company, The. Method for stabilization of UV sensitive plastics with substituted 1,3-oxazolidine. 4,104,254, Cl. 260-45.8NZ.

Laitram Corporation, The: *See—*
Fowler, John T., 4,103,638, Cl. 114-144.00E.

Lambertsen, Ejvind, to i. c. moller a/s. System for localizing a spot along a conductor in which an impedance change such as a break or short circuit occurs. 4,104,582, Cl. 324-52.000.

Lampkin, Curtis: *See—*
Jordan, John F.; and Lampkin, Curtis, 4,104,420, Cl. 427-74.000.

Landis, Phillip S.; and Okorodudu, Abraham O. M., to Mobil Oil Corporation. Additives comprising (N, N-diorganothiocarbamyl) phosphorothioites and lubricant compositions containing the same. 4,104,181, Cl. 252-46.700.

Landry, Robert G.; and Jenney, Sherman R. Truck air foils. 4,103,957, Cl. 296-1.00S.

Lang-ree, Nils: *See—*
Hemborg, Goeran; Green, Winje; Lang-ree, Nils; and Baker, Edward D., 4,103,605, Cl. 99-345.000.

Lange, Harold T., to Sporlan Valve Company. Bidirectional flow filter-drier assembly. 4,104,044, Cl. 62-324.000.

Langley, Robert, to Ciba-Geigy Corporation. Process for preparing an alpha or beta form copper phthalocyanine pigment. 4,104,277, Cl. 260-314.500.

Lansiart, Alain; Gaucher, Jean-Claude; Lequais, Jean; Moretti, Jean-Luc; and Quettier, Annick, to Commissariat a l'Energie Atomique. Ultrasonic camera. 4,103,677, Cl. 128-2.00V.

Laos, Ivar: *See—*
Baran, John S.; and Laos, Ivar, 4,104,271, Cl. 260-239.570.

Lapidus, Herbert; and Shansky, Albert, to Combe Incorporated. Process for dyeing hair in which the depth of shade is gradually increased in successive treatments. 4,104,021, Cl. 8-10.200.

LaRaus, Julius. Apparatus for purifying septic tank effluent. 4,104,166, Cl. 210-195.00R.

Larkins, John S. Internal combustion-gas turbine engine. 4,103,651, Cl. 123-50.00B.

Larson, Hugo R.: *See—*
Ridenour, Charles E.; Fabert, Herman A., Jr.; Tasker, John; and Larson, Hugo R., 4,104,504, Cl. 219-73.100.

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Huertgen, Helmut B.; Larson, Walter F.; and Sibler, Guenter W., 4,103,529, Cl. 72-253.00A.

Lasater, Donald A.; and Ebbesmeyer, Steven R., to Dover Corporation. Swivel connector. 4,103,938, Cl. 285-136.000.

Lash, Ronald J.; and Kardos, Otto, to M&T Chemicals Inc. Alloy plating. 4,104,137, Cl. 204-43.00T.

Lash, Ronald J.: *See—*
Passal, Frank; Lash, Ronald J.; and Kardos, Otto, 4,104,138, Cl. 204-44.000.

Latorella, William. Shell fish tool. 4,103,395, Cl. 17-71.000.

La Tour, John, Jr. Replacement valve assembly for flush tank toilets. 4,103,366, Cl. 4-393.000.

Latta, Bruce M.; Stevens, Catherine V.; and Dennis, Bruce E., to J. P. Stevens & Co., Inc. Antistatic finish for textiles material. 4,104,443, Cl. 428-474.000.

Laudemann, Ronald L.; and Kasten, Gary L. Bale handling device. 4,103,831, Cl. 214-1.0HA.

Laurent, Jean, to Institut Francais du Petrole. Device for embedding flexible elements of great length in the ground. 4,103,501, Cl. 61-72.600.

Lavigne, Joe B., to Chevron Research Company. Ester derivatives. 4,104,477, Cl. 560-122.000.

Law, John P., to Ingersoll-Rand Company. Grinder safety device. 4,103,460, Cl. 51-170.00R.

Lawrence, Peter A. Shoe with detachable upper. 4,103,440, Cl. 36-101.000.

Laws, Peter Graham: *See—*
Smith, Richard Hanley; and Laws, Peter Graham, 4,104,714, Cl. 363-21.000.

Lawson, Harry W., Jr., to Acme Electric Corp. Alternating current to alternating current converter apparatus. 4,104,715, Cl. 363-37.000.

Lazarre, Flavien: *See—*
Blu, Gilbert; and Lazarre, Flavien, 4,103,707, Cl. 137-604.000.

Le Moteur Moderne: *See—*
Jarry, Philippe, 4,103,648, Cl. 123-30.00R.

Lear Siegler, Inc.: *See—*
Homier, Robert I., 4,103,970, Cl. 297-363.000.
Knoke, Silas J., 4,103,374, Cl. 5-176.00R.

Leaver, Helen S.: *See—*
Davis, Phillip K.; Leaver, Helen S.; and Freiser, Henry, 4,104,359, Cl. 423-139.000.

Lebow Associates, Inc.: *See—*
Rykwalder, Stanley J.; and Zink, Frederick J., 4,103,545, Cl. 73-141.00A.

Lecoustey, Andre: *See—*
Berard, Michel; and Lecoustey, Andre, 4,103,568, Cl. 74-801.000.

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Hansen, Clarence M.; Harvey, John P.; and Ledebuhr, Richard L., 4,103,607, Cl. 99-548.000.

Ledley, Robert E., III, to Suntech, Inc. Electronic digital micrometer. 4,103,427, Cl. 33-166.000.

Lee, Henry L., Jr.; and Orlowski, Jan A., to Lee Pharmaceuticals. Self-curing artificial fingernails. 4,104,333, Cl. 260-885.000.

Lee, James Kelly: *See—*
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LeFevre, Robert J., to Burron Medical Products, Inc. Dual valve assembly. 4,103,686, Cl. 128-214.00R.

Lehmkuhl, Herbert: *See—*
Eisenbach, Wilhelm; Lehmkuhl, Herbert; and Wilke, Gunther, 4,104,140, Cl. 204-78.000.

Lehner, Gerald J.; and Banka, Eugene F., to Burroughs Corporation. Apparatus for reducing the number of undetected errors read along the length of a binary information bearing medium. 4,104,682, Cl. 360-2.000.

Leighton, Stephen Beecher. Tissue pressure reference for cerebrospinal fluid shunting device. 4,103,689, Cl. 128-350.00V.

Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, to Argus Chemical Corporation. Carbonate ester stabilizers for polymers. 4,104,217, Cl. 260-23.0XA.

Leitner, Roland L.: *See—*
Weiss, Marvin; Adams, Phillip; Nass, Gerald I.; and Leitner, Roland L., 4,104,144, Cl. 204-159.230.

Lenkner, William A.: *See—*
Levand, Victor A., Jr.; and Lenkner, William A., 4,104,705, Cl. 362-5.000.

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Winkler, Alfred; Lermann, Peter; Engelsmann, Dieter; and Fauth, Gunter, 4,104,664, Cl. 354-213.000.
Winkler, Friedrich; Theer, Anton; Lermann, Peter; Stenzenberger, Volkmar; Griessner, Peter; Sandl, Dieter; Muller, Hermann; and Wilsch, Herbert, 4,103,993, Cl. 352-140.000.

Les Produits Organiques du Santerre Orsan: *See—*
Duc, Nguyen-Cong; Brehant, Jean-Louis Marie; Pons, Benoit-Joseph; and Sechet, Maurice Henri, 4,104,123, Cl. 195-31.00P.

Lesher, George Y.; and Opalka, Chester J., Jr., to Sterling Drug Inc. Cyclic alkylidenyl N-[6-(amino)-3-pyridazinyl]aminomethylenemalonates. 4,104,385, Cl. 424-250.000.

Levand, Victor A., Jr.; and Lenkner, William A., to General Electric Company. Photoflash lamp array having shielded switching circuit. 4,104,705, Cl. 362-5.000.

Levenhagen, Alvin W., to Molded Fiber Glass Tray Company. Reinforced fiberglass pallet. 4,103,857, Cl. 248-346.000.

Levine, Harvey: *See—*
Bergmann, Karl H.; and Levine, Harvey, 4,103,603, Cl. 99-294.000.

Levinson, Melvin L. Microwave drying. 4,103,431, Cl. 34-4.000.

Levrant, Melvyn A.: *See—*
Melling, Norman D.; De Matteo, John J.; Levrant, Melvyn A.; and Juels, Ronald J., 4,104,608, Cl. 340-3.0PS.

Lewis, John H.; Lewis, Kathrine J.; Reizman, Fremont; and Welkowsky, Murray S., to Xonics, Inc. Image charge relaxation in electrophoretic displays. 4,104,520, Cl. 250-315.00R.

Lewis, Kathrine J.: *See—*
Lewis, John H.; Lewis, Kathrine J.; Reizman, Fremont; and Welkowsky, Murray S., 4,104,520, Cl. 250-315.00R.

Ley, Kurt; Hagemann, Hermann; and Hurnik, Helmut, to Bayer Aktiengesellschaft. Blowing agents based on urea dicarboxylic acid anhydride. 4,104,195, Cl. 252-350.000.

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Heffler, Jochen, 4,104,197, Cl. 252-425.300.
Kolbeck, Rainer; Kuckenburg, Heinz; and Schaffernicht, Klaus, 4,104,554, Cl. 313-447.000.

Lidicker, Roger E.: *See—*
Rose, Frederick A.; Nord, Russell H.; and Lidicker, Roger E., 4,104,725, Cl. 364-487.000.

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Hahn, Heinrich; Heumann, Hans; Liebing, Heinz; Schweppe, Manfred; and Hilt, Walter, 4,104,362, Cl. 423-315.000.

Lien, Charles: *See—*
Cohen, David A.; and Lien, Charles, 4,104,564, Cl. 315-171.000.

Lien, Del R. Lamp switch circuit. 4,104,540, Cl. 307-114.000.

Liggett, Louis G.: *See—*
Shanbhag, Sudhakar P.; Liggett, Louis G.; and Mikovits, Adrienne C., 4,104,415, Cl. 426-656.000.

Lightolier Incorporated: *See—*
Chan, Kingsley; Patel, Mahendra K.; and Wolkin, Sidney, 4,104,713, Cl. 362-294.000.

Lijbrink, Eduard: *See—*
Scholtus, Christiaan Gustaaf Adolf; Lijbrink, Eduard; Meijer, Franciscus Alexander Theodorus; and Ruiter, Antonius, 4,103,816, Cl. 228-49.000.

Lindal, Sir Walter. Compressable prefabricated panel sections for wood frame buildings. 4,103,467, Cl. 52-404.000.

Lindberg, Ronald O. J.: *See—*
Wheeler, Jay A.; Miszkiewicz, Henry L.; Lindberg, Ronald O. J.; and Willmore, James A., 4,104,603, Cl. 335-306.000.

Lindemann, Werner: *See—*
Ratz, Walter; and Lindemann, Werner, 4,104,592, Cl. 325-37.000.

Linguenheld, Louis, to Rhone-Poulenc Industries. Organosilicon sunlight-resistant pastes. 4,104,237, Cl. 260-37.0SB.

Lion, Fat & Oil Company, Ltd.: *See—*
Inagaki, Takeo; Nakagawa, Hideki; and Isa, Hiroshi, 4,104,232, Cl. 260-31.600.

Lippert, Karl; and Planken, Heinz, to Duisburger Kupferhutte. Process for working up copper cementate sludges. 4,104,055, Cl. 75-1.00R.

Liquid Controls Corporation: *See—*
Rittenhouse, Howard E., 4,104,511, Cl. 235-132.00R.

List, Ralph W., to Techniservice Division, Textured Yarn Co., Inc. Strand winding apparatus. 4,103,835, Cl. 242-18.00A.

Lista, Edwin L.; and Williams, Kenneth S., to Aerojet-General Corporation. Staple orienting method and apparatus. 4,103,584, Cl. 86-1.00R.

Litman, Alan, to Smith & Wesson Chemical Company, Inc. Warning light for emergency vehicles. 4,104,614, Cl. 340-81.00R.

Liu, William Chang; Bratton, Francis H.; and Nali, Robert Ronald, to Brunswick Corporation. Crosslinked molded pile product. 4,104,428, Cl. 428-85.000.

Lloyd, Ruth Diane: *See—*
Schardein, Daniel Joseph; and Lloyd, Ruth Diane, 4,104,136, Cl. 204-38.00B.

Lobley, Derek Gordon: *See—*
Howard, John; and Lobley, Derek Gordon, 4,104,365, Cl. 423-531.000.

Lobur, Terry J. Collapsible bag for impact absorbing activities and method of making. 4,103,889, Cl. 272-77.000.

Lockheed Aircraft Corporation: *See—*
Cronin, Michael Joseph, 4,104,620, Cl. 340-642.000.

Lockshaw, James J., to Tolo, Incorporated. Pool cover having solar energy heating feature. 4,103,368, Cl. 4-172.120.

Lomax, Donald P.; and Boggs, Ronald M. Backing material. 4,103,800, Cl. 138-145.000.

Lombardi, Victor J.; and Dalmau, José Ma, to Jumberca S.A., by José Ma Dalmau, a part interest. Knitting machine for knitting fabrics having terry loops at least on the technical front face thereof. 4,103,518, Cl. 66-107.000.

Loofbourow, Donald I.; and Lach, Robert E., to GAF Corporation. Film web handling mechanism. 4,103,846, Cl. 242-205.000.

Lorang, Walter R. Golf grip training apparatus. 4,103,896, Cl. 273-183.00D.

Lorenze, Robert V., Jr.; and White, William Joseph, to Honeywell Inc. Double sided hybrid mosaic focal plane. 4,104,674, Cl. 357-30.000.

Losinger AG: *See—*
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Louisiana State University Foundation: *See—*
Srinivasan, Vadake R.; and Choi, Ye-Chin, 4,104,124, Cl. 195-33.000.

Lowdermilk, Loren L., to International Paper Company. Atmosphere exchanging and bag sealing machine and method. 4,103,471, Cl. 53-22.00B.

Lowe, James R., to McDonnell Douglas Corporation. Head-up display command bar generator. 4,104,612, Cl. 340-27.0AT.

Lubrication Engineers, Inc.: *See—*
Dinwiddie, Curt, 4,103,533, Cl. 73-12.000.

Luc, Andre R., to Tridon-Serflex S. A. Method of shaping a screw type clamping collar. 4,103,637, Cl. 113-116.00M.

Lucas Electrical Limited: *See—*
Hill, William Frank; and Southgate, John Peter, 4,104,534, Cl. 290-37.00A.

Lucas Industries Limited: *See—*
Holt, William David, 4,103,661, Cl. 123-179.00H.

Luedtke, Oscar F.; and Luedtke, Sarah. Portable folding bed cabinet. 4,103,373, Cl. 5-166.00R.

Luedtke, Sarah: *See—*
Luedtke, Oscar F.; and Luedtke, Sarah, 4,103,373, Cl. 5-166.00R.

Luke, John Anthony, to Brown & Williamson Tobacco Corporation. Porous wraps for smoking articles. 4,104,431, Cl. 428-211.000.

Lund, Terry E.: *See—*
Yerushalmi, Joseph; Ehrlich, Shelton; Maaghoul, Mohammad, deceased; and Lund, Terry E., 4,103,646, Cl. 122-4.00D.

Lundstrom, Goran; and Nolte, Karl, to Hugin Kassaregister AB. Coding lock. 4,104,490, Cl. 200-44.000.

Lupien, Paul J.; Awad, John A.; and Moorjani, Sital. Method and apparatus for extravascular treatment of blood. 4,103,685, Cl. 128-214.00R.

Lurssen, Klaus: *See—*
Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; and Lurssen, Klaus, 4,104,049, Cl. 71-76.000.

Lutron Electronics Co., Inc.: *See—*
DeWitt, Robert R., 4,104,606, Cl. 338-198.000.

Luttrell, Edward; and Turner, Paul W., to United States of America, Energy. Electric arc welding gun. 4,104,499, Cl. 219-60.00A.

Luz, David Warren: *See—*
Peer, John Charles; and Luz, David Warren, 4,104,567, Cl. 315-387.000.

Lynnworth, Lawrence C., to Panametrics, Inc. Ultrasonic measuring system for differing flow conditions. 4,103,551, Cl. 73-194.00A.

Lyon, John A.; and Whyel, Robert E., Jr. Compound bow holsters. 4,103,807, Cl. 224-1.00R.

M & M Tools, Inc.: *See—*
Matthews, Robert L., 4,103,571, Cl. 81-74.000.

M&T Chemicals Inc.: *See—*
Bednarski, John R.; and Russell, David B., 4,104,234, Cl. 260-33.6UA.
Dworkin, Robert D.; and Ejk, Adam J., 4,104,292, Cl. 260-429.700.
Kenney, James F., 4,104,263, Cl. 528-279.000.
Lash, Ronald J.; and Kardos, Otto, 4,104,137, Cl. 204-43.00T.
Passal, Frank; Lash, Ronald J.; and Kardos, Otto, 4,104,138, Cl. 204-44.000.

Maaghoul, Mohammad, deceased: *See—*
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Maaghoul, Nassrine S., administratrix: *See—*
Yerushalmi, Joseph; Ehrlich, Shelton; Maaghoul, Mohammad, deceased; and Lund, Terry E., 4,103,646, Cl. 122-4.00D.

Maas, Hermann; and Hahn, Franz-Josef. Method for making low carbon high chromium alloyed steels. 4,104,057, Cl. 75-49.000.

Macbeth, John C.: *See—*
Hendrixson, Dale Z.; and Macbeth, John C., 4,103,456, Cl. 47-57.500.

MacBride, James J.: *See—*
Hutchison, Robert V.; Gregg, Peter P.; and MacBride, James J., 4,104,700, Cl. 361-384.000.

MacDonald, Robert D., to Masco Corporation. Door closing apparatus. 4,103,392, Cl. 16-54.000.

MacGregor, James G.: *See—*
Johnston, Charles Richard; and MacGregor, James G., 4,103,926, Cl. 280-414.00R.

Machines Chambon: *See—*
Corse, Louis Gaston, 4,103,595, Cl. 93-58.300.

Mack, Robert L. Process for manufacturing printed circuit boards. 4,104,111, Cl. 156-656.000.

Macosko, Robert Lee. Hand held applicator. 4,104,110, Cl. 156-523.000.

Maeda, Eiji: *See—*
Aoki, Shunichi; and Maeda, Eiji, 4,103,731, Cl. 164-147.000.

Maeding, Dale G., to Hughes Aircraft Company. Multichannel CCD signal subtraction system. 4,104,543, Cl. 307-221.00D.

Maeshima, Tsugio: *See—*
Nishikawa, Eiichiroh; Itoh, Takuji; Maeshima, Tsugio; and Kamiyama, Setsuo, 4,104,361, Cl. 423-239.000.

Maffrand, Jean-Pierre: *See*—
Ferrand, Gerard; Frehel, Daniel; and Maffrand, Jean-Pierre, 4,104,390, Cl. 424-256.000.

Mages, Bernhard: *See*—
Rock, Erich; and Mages, Bernhard, 4,103,394, Cl. 16-129.000.

Maglott, Larry Franklin. Framing system. 4,103,446, Cl. 40-155.000.

Magni-Power Company: *See*—
Rudd, Edward H., 4,103,982, Cl. 339-91.00R.

Magosch, Karl-Heinz; Feinauer, Roland; and Ruter, Jorn, to Chemische Werke Huls, AG. Low pilling polyester fibers and process for their manufacture. 4,104,261, Cl. 260-873.000.

Maher, John P.; and Johnson, Theodore W., to Sprague Electric Company. Method of making a glass containing resistor having a submicron metal film termination. 4,104,421, Cl. 427-96.000.

Mahn, Frederick; Breindel, Kenneth; Scanley, Clyde; and Sexsmith, David, to Drew Chemical Corporation. Foam prevention in sodium carbonate crystallization. 4,104,033, Cl. 23-300.000.

Mahoney, Gerard Edward: *See*—
DiLorenzo, James Vincent; Mahoney, Gerard Edward; and Moran, Joseph Michael, 4,104,672, Cl. 357-22.000.

Mahoski, Calvin Michael: *See*—
Baker, Robert Lee; Mahoski, Calvin Michael; Partilla, John David; and Ronan, Harold Robert, Jr., 4,104,589, Cl. 324-158.00F.

Maier, Charles L., Jr. Procedure for the assay of pharmacologically immunologically and biochemically active compounds in biological fluids. 4,104,029, Cl. 23-230.00B.

Maier, Edward E.: *See*—
Didycz, William J.; Glassman, Donald; Maier, Edward E.; and Saniga, George T., 4,104,131, Cl. 203-7.000.

Main, Ronald J.: *See*—
Arnholt, Jack C.; and Main, Ronald J., 4,103,934, Cl. 280-744.000.

Mainka, Christian M., to Morse Boulger, Inc. Stoker and grate therefore. 4,103,627, Cl. 110-281.000.

Mainski, Albert: *See*—
Ohorodnik, Alexander; Gehrmann, Klaus; Schafer, Stefan; and Mainski, Albert, 4,104,299, Cl. 260-543.00P.

Maitani, Yoshihisa; Shimoyama, Kunio; Yoshida, Muneaki; Hashimoto, Akihiko; and Kitagawa, Masahiro, to Olympus Optical Co., Ltd. Photometric apparatus for single lens reflex camera. 4,104,654, Cl. 354-31.000.

Malaval, Claude, to Groupement Atomique Alsacienne Atlantique. Solid absorbent safety device for a nuclear reactor. 4,104,121, Cl. 176-86.00R.

Malaval, Claude; and Picou, Jean-Loup, to Groupement Atomique Alsacienne Atlantique. Liquid absorbent safety device for a nuclear reactor. 4,104,122, Cl. 176-86.00L.

Malecki, George J. Processing of green vegetables for color retention in canning. 4,104,410, Cl. 426-399.000.

Malkin, Irving: *See*—
Brannan, James R.; Malkin, Irving; and Brown, Claude M., 4,104,133, Cl. 204-25.000.

Malmberg, Sven Kurt Bernhard. Method and arrangement for fastening and centering punching tools. 4,103,413, Cl. 29-465.000.

Manabe, Katsuhide; Masumi, Jiro; Tochitani, Tomotada; and Shinoda, Kenzo, to Toyoda Gosei Kabushiki-Kaisha (Toyoda Synthetics Co., Ltd.). Plastic articles having on the surface thereof a protected metal film. 4,104,432, Cl. 428-216.000.

Mangubi, Jury Danilovich: *See*—
Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.

Manitowoc Company, Inc., The: *See*—
Beduhn, Daniel E.; Morrow, James G., Sr.; and Pech, David J., 4,103,783, Cl. 212-48.000.

Mannesmann Aktiengesellschaft: *See*—
Wessel, Otto; Hofmann, Georg; Gesell, Hartmut; and Scholz, Werner, 4,104,342, Cl. 264-12.000.

Mansmann, Manfred, to Bayer Aktiengesellschaft. Thermally stable quartz glass. 4,104,045, Cl. 65-2.000.

Mantell, Gerald J.: *See*—
Dixon, Dale D.; Ford, Michael E.; and Mantell, Gerald J., 4,104,264, Cl. 528-370.000.

Marantz Company, Inc.: *See*—
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Marchetti, Joseph R.; Zwack, Robert R.; and Jerabek, Robert D., to PPG Industries, Inc. Process for cationic electrodeposition of amine acid salt-containing polymers. 4,104,147, Cl. 204-181.00C.

Marcin, Richard, to Newcor, Inc. Limited torque drive roller. 4,103,516, Cl. 64-30.00E.

Mark, Victor; and Wilson, Phillip Steven, to General Electric Company. Polycarbonate compositions containing iminated and thionated carbonate plasticizers. 4,104,231, Cl. 260-30.80R.

Mark, Victor, to General Electric Company. Non-opaque flame retardant polycarbonate composition. 4,104,245, Cl. 260-45.70S.

Mark, Victor, to General Electric Company. Non-opaque flame-retardant polycarbonate composition. 4,104,246, Cl. 260-45.70S.

Mark, Victor, to General Electric Company. Flame retardant polycarbonate composition. 4,104,253, Cl. 260-45.8RW.

Markley, Lowell D.: *See*—
Dewald, James R.; and Markley, Lowell D., 4,104,315, Cl. 260-650.00R.

Markstein, Peter Willy; and Tritter, Alan Levi, to International Business Machines Corporation. Hierarchical security mechanism for dynamically assigning security levels to object programs. 4,104,721, Cl. 364-200.000.

Marsh, Richard L.: *See*—
Novotny, Donald S.; Marsh, Richard L.; Masters, Frank C.; and Tally, David N., 4,104,205, Cl. 260-2.300.

Marshall and Williams Company: *See*—
Parrillo, Henry; Harrington, John Sherman; and Curtis, Glenn Howard, 4,103,403, Cl. 26-91.000.

Martan, Michael; and Halter, Mark A., to UOP Inc. Electrochemical oxidation of alkoxy-substituted aromatic compounds. 4,104,141, Cl. 204-78.000.

Martin, Alice I. Snow drag and scoop. 4,103,383, Cl. 15-245.000.

Martin, John R.; and Block, Robert S. System for accumulating data over nondedicated telephone lines. 4,104,486, Cl. 179-2.0AM.

Martin Marietta Corporation: *See*—
Thomas, Frank J.; and Farrow, Max W., 4,103,847, Cl. 244-3.180.
Wolfert, Ludwig G., 4,104,523, Cl. 250-370.000.

Martin, Thomas F.; Nagy, James A.; and Scibbe, Harold R., to Repa Feinstanzwerk GmbH. Locking sensor for belt retractor. 4,103,842, Cl. 242-107.40A.

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Maruyama, Mitsuaki. Wristwatch having a liquid crystal display. 4,103,482, Cl. 58-23.00R.

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Matsuda, Mari: *See*—
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Matsuda, Mutsuhide: *See*—
Matsumoto, Seiichi; Matsuda, Mutsuhide; and Yokota, Hideo, 4,104,651, Cl. 354-25.000.

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Nanba, Kamori; Ueda, Tomoyuki; and Matsuda, Tetsunori, 4,103,865, Cl. 251-148.000.

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Matsumura, Akira: *See*—
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Matsushita Electric Industrial Co., Ltd.: *See*—
Kitamura, Yoshinori; and Nakabe, Ryuhei, 4,104,679, Cl. 358-44.000.
Miyai, Yukio; Kojo, Takeshi; Takahashi, Junichi; Yoshioka, Satoshi; Nakamichi, Kensuke; Okada, Kozo; and Takeda, Setsuko, 4,104,584, Cl. 324-58.50R.
Satoh, Isao; and Kato, Makoto, 4,104,489, Cl. 179-100.30G.
Wakami, Noboru; and Deguchi, Masahiro, 4,104,684, Cl. 360-70.000.
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Inoue, Hiromitsu; Katayama, Susumu; and Ohashi, Hiroshi, 4,104,610, Cl. 340-15.000.
Matthews, Bruce Ernest; and Day, Ronald, to Stanley Works Pty. Ltd., The. Pipe cutter. 4,103,419, Cl. 30-95.000.
Matthews, Robert L., to M & M Tools, Inc. Hub nut wrench. 4,103,571, Cl. 81-74.000.
Matthey, Huber: *See*—
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Mattiuz, Ronald: *See*—
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Matumoto, Eizi; and Norimatsu, Hideaki, to Nippondenso Co., Ltd. Method and system for controlling the mixture air-to-fuel ratio. 4,103,649, Cl. 123-32.0EE.
Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; and Lurssen, Klaus, to Bayer Aktiengesellschaft. Chlorine-substituted vinylaminobenzoic acid compounds and plant growth regulant compositions. 4,104,049, Cl. 71-76.000.
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Mayer, Norbert: *See*—
Wiezer, Hartmut; Pfahler, Gerhard; and Mayer, Norbert, 4,104,251, Cl. 260-45.80N.
Mayer, Raymond E. Display units. 4,103,782, Cl. 211-126.000.
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Mazurik, Vitaly Ivanovich: *See*—
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Westeren, Herbert W.; and McCally, Richard P., 4,103,880, Cl. 266-253.000.
McCraw, Dan, to Domination Incorporated. Disk rolling game of variable difficulty. 4,103,894, Cl. 273-126.00A.
McCreery, Cecil Wayne, to Glass Industry Consultants, Inc. Temperature control for the forming units of a machine of the press and blow type. 4,104,046, Cl. 65-161.000.
McDonald, Frank W. Wheel-wear monitor. 4,103,548, Cl. 73-146.000.
McDonald, Leo S., Jr., to Greyhound Exhibitgroup, Inc. Modular panel display system. 4,103,465, Cl. 52-127.000.
McDonnell Douglas Corporation: *See*—
Gonzalez, Rodolfo; and Penton, Allen P., III, 4,104,426, Cl. 428-36.000.
Lowe, James R., 4,104,612, Cl. 340-27.0AT.
McDowell, Donald J., to Felt Products Mfg. Co. Fretting corrosion resistant gasket and method of making same. 4,103,913, Cl. 277-235.00B.
McElwain, John Christee; and Hogan, Lawrence Howard, to Rockwell International Corporation. Universal joint and cross therefor. 4,103,512, Cl. 64-17.00A.
McGraw-Edison Company: *See*—
Bannan, Edward C., 4,103,853, Cl. 248-219.100.
McHatton, Austin D.: *See*—
Alley, Vernon L., Jr.; and McHatton, Austin D., 4,103,550, Cl. 73-159.000.
McIvor, Malcolm Charles, to Imperial Chemical Industries Limited. Method of examination of protective coatings. 4,104,579, Cl. 324-29.000.
McKay, Richard A., to United States of America, National Aeronautics and Space Administration. Combuster. 4,104,018, Cl. 432-29.000.
McLaughlin, Robert R. Testing device for in-site cementitious material. 4,103,540, Cl. 73-88.00C.
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Proud, Joseph M., Jr.; and McNeill, William H., 4,104,558, Cl. 315-39.000.
McNulty, Patrick J.; and Warner, Harlow L., to Rohm and Haas Company. Derivatives of 3-cyano-pyrid-2-ones. 4,104,273, Cl. 260-294.900.
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Melcher, Franz Josef; and Oldendorf, Christian, to Sartorius-Werke GmbH (und vorm. Gottinger Prazisionswaagenfabrik GmbH). Method of and circuit for forming signals for damping control of an electrical measured-value indicator. 4,103,750, Cl. 177-1.000.
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Bergmann, Karl H.; and Levine, Harvey, 4,103,603, Cl. 99-294.000.
Melling, Norman D.; De Matteo, John J.; Levrant, Melvyn A.; and Juels, Ronald J., to United States of America, Navy. Heave meter. 4,104,608, Cl. 340-3.0PS.
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Melzer, Jaroslav; and Schenck, Hans-Uwe, to BASF Aktiengesellschaft. Retention aids and flocculants based on polyacrylamides. 4,104,226, Cl. 260-29.6WB.
Mende, Hans-Joachim: *See*—
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Mendenhall, Robert L. Apparatus and method for recycling used asphalt-aggregate composition. 4,104,736, Cl. 366-2.000.
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Merchant, Philip, Jr.; Powell, F. Luther; and Ohaji, Cosmas O., to Exxon Research & Engineering Co. Water soluble waterflood corrosion inhibitor. 4,104,174, Cl. 252-8.55D.
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Mesch, Franz; and Moll, Horst, to Ernst Leitz Wetzlar GmbH. Method and optical system for automatic parallax determination. 4,104,517, Cl. 250-204.000.

Mesny, Philip R.; and Peoples, Jake E. Vehicle levelling and stabilizing system. 4,103,869, Cl. 254-86.00R.
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Pfeuffer, Alfred, 4,103,877, Cl. 266-51.000.
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Meyer, Victor E.; and Kem, Kenneth M., to Dow Chemical Company, The. Linear, partially deacylated poly(N-acyl)alkylenimines as tannin migration inhibitors. 4,104,228, Cl. 260-29.6NR.
Meyer, Warren A. Solar collector. 4,103,672, Cl. 126-270.000.
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Michels, Norman C. Apparatus for coating one side only of strip material. 4,103,644, Cl. 118-62.000.
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Munse, Robert A., 4,103,400, Cl. 24-73.0MF.
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Mikes, John A.; Greer, Albert H.; and Norwood, Amos, to Sybron Corporation. Highly porous ion exchange resins prepared by suspension polymerization in the presence of linear polymer. 4,104,209, Cl. 521-62.000.
Mikhaevich, Stanislav Leonidovich: *See—*
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Miki, Isao, to Nippon Light Metal Company Limited. Die-cast aluminum alloy products. 4,104,089, Cl. 148-32.500.
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Miles, Peter; Hargreaves, James Roger; and Burrows, John, to Ciba-Geigy Corporation. Corrosion inhibitors. 4,104,423, Cl. 427-402.000.
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Mitchell, Ronald A.; and Bedford, William Augustus, Jr., to Mitchell, Ronald A. Theftproof steering wheel lock. 4,103,524, Cl. 70-209.000.
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Kumazawa, Toshiharu, 4,103,827, Cl. 239-8.000.
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Mitter, Mathias. Screen printing machine with reciprocating endless printing screen. 4,103,614, Cl. 101-115.000.
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Moog, Gerhard W.; and Cooper, Kenneth R., to Canada Square Management Ltd. Reservoir. 4,103,706, Cl. 137-574.000.

Moon, Howard R.: *See—*
Morrison, Lowell D.; and Moon, Howard R., 4,103,983, Cl. 339-91.00R.

Moore, Harry D.: *See—*
Strussion, Thomas; and Moore, Harry D., 4,103,436, Cl. 35-40.000.

Moore, Wayne O. Apparatus for production of precast manhole bases. 4,103,862, Cl. 249-53.00R.

Moorjani, Sital: *See—*
Lupien, Paul J.; Awad, John A.; and Moorjani, Sital, 4,103,685, Cl. 128-214.00R.

Moran, Joseph Michael: *See—*
DiLorenzo, James Vincent; Mahoney, Gerard Edward; and Moran, Joseph Michael, 4,104,672, Cl. 357-22.000.

Moran, Thomas L.: *See—*
Paul, Dwaine M., 4,103,743, Cl. 166-299.000.

Moretti, Jean-Luc: *See—*
Lansiart, Alain; Gaucher, Jean-Claude; Lequais, Jean; Moretti, Jean-Luc; and Quettier, Annick, 4,103,677, Cl. 128-2.00V.

Morgan Adhesives Company: *See—*
Eagon, Beverly M.; Carlson, Russell L.; and Fry, Raymond C., 4,104,102, Cl. 156-298.000.

Morgan, Albert W.: *See—*
Mathis, Thomas C.; Morgan, Albert W.; and Vanderlinde, William, 4,104,233, Cl. 260-31.8HA.

Morgan, Wesley W.; and Davis, Frank E., to Columbia Industries, Inc. Method of making a bowling pin. 4,104,352, Cl. 264-250.000.

Mori, Kazumasa: *See—*
Kato, Tetsuo; and Mori, Kazumasa, 4,104,560, Cl. 315-83.000.

Mori, Shigeyasu: *See—*
Arita, Hidemasa; Tomiyama, Hitoshi; and Mori, Shigeyasu, 4,104,041, Cl. 55-90.000.

Moriguchi, Koichi: *See—*
Oi, Naobumi; Moriguchi, Koichi; and Matsuda, Mari, 4,104,040, Cl. 55-67.000.

Morita, Akira: *See—*
Ueno, Zene; Morita, Akira; and Chida, Atushi, 4,103,653, Cl. 123-117.00R.

Moritz, Holger; and Paal, Gabor, to International Business Machines Corporation. Method of making a negative photoresist image. 4,104,070, Cl. 96-36.000.

Morris, Charles A.: *See—*
Jain, Sulekh C.; and Morris, Charles A., 4,104,178, Cl. 252-30.000.

Morris, Glenn H. Tightly closed safety cap and vial. 4,103,797, Cl. 215-209.000.

Morrison, Lowell D.; and Moon, Howard R., to Gamber-Johnson, Inc. Quick disconnect slide mount. 4,103,983, Cl. 339-91.00R.

Morrison, Steven; and Dorman, William J., to Westinghouse Electric Corp. Boresight adjustment for a harmonic oscillator coordinate converter. 4,104,730, Cl. 364-815.000.

Morrow, James G., Sr.: *See—*
Beduhn, Daniel E.; Morrow, James G., Sr.; and Pech, David J., 4,103,783, Cl. 212-48.000.

Morse Boulger, Inc.: *See—*
Mainka, Christian M., 4,103,627, Cl. 110-281.000.

Moss, Alan, to Golden Wonder Limited. Check weighing apparatus for articles. 4,103,751, Cl. 177-122.000.

Motohashi, Michio: *See—*
Sugihara, Hirosada; Watanabe, Masazumi; Motohashi, Michio; Nishikawa, Masao; and Sanno, Yasushi, 4,104,402, Cl. 424-330.000.

Mouille, Rene Louis, to Societe Anonyme dite Societe Nationale Industrielle Aerospatiale. Rotor arrangement for rotary wing aircraft. 4,104,003, Cl. 416-141.000.

Mounts, Stanley Homer: *See—*
Resnick, Marvin; and Mounts, Stanley Homer, 4,103,389, Cl. 15-302.000.

MSI Data Corporation: *See—*
Sherer, Paul; and Hester, Gerald Paul, 4,104,514, Cl. 235-466.000.

Muchiarone, Jerome J., to True Temper Corporation. Antenna formed of two closely coupled linear conductors with helical top loading. 4,104,639, Cl. 343-723.000.

Muise, Herbert D., to Weyerhaeuser Company. Two-piece container. 4,103,819, Cl. 229-33.000.

Mullay, John J., to Atlas Powder Company. Emulsion sensitized gelled explosive composition. 4,104,092, Cl. 149-2.000.

Muller, Gotthard: *See—*
Buchler, Wilhelm; Muller, Gotthard; and Mende, Hans-Joachim, 4,103,861, Cl. 249-20.000.

Muller, Hans; and Guazzone, Bruno, to Muller, Hans. Filtering apparatus with rotatable filter elements and seal. 4,104,169, Cl. 210-331.000.

Muller, Hermann: *See—*
Winkler, Friedrich; Theer, Anton; Lermann, Peter; Stenzenberger, Volkmar; Griessner, Peter; Sandl, Dieter; Muller, Hermann; and Wilsch, Herbert, 4,103,993, Cl. 352-140.000.

Mullet, David; Rilling, Raymond J.; and Voth, Elmer D., to Excel Industries, Inc. Grass and leaf collector and compactor attachment for mowers. 4,103,477, Cl. 56-202.000.

Multinorm B.V.: *See—*
Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, 4,103,476, Cl. 56-13.600.

Mumford, Harry W.: *See—*
Deinert, J. Clifford; Taylor, Charles E.; and Mumford, Harry W., 4,103,844, Cl. 242-107.000.

Munk, Edmund; Haas, Herbert; and Weinberg, Gerd, to Werzalit-Pressholzwerk J.F. Werz Jr. KG. Method and apparatus for filling molds. 4,104,348, Cl. 264-121.000.

Munse, Robert A., to Microdot Inc. Dart clip. 4,103,400, Cl. 24-73.0MF.

Murakami, Keisuke. Instrument for setting a non-skid chain on a car tire. 4,103,870, Cl. 254-88.000.

Murata, Saburo: *See—*
Kato, Koich; and Murata, Saburo, 4,104,247, Cl. 260-45.70R.

Murata, Takao; Nakamura, Nobutaka; and Goto, Tateo, to Sumitomo Durez Company, Ltd. Wax compositions for flame retardant electrical insulation coatings. 4,104,698, Cl. 361-321.000.

Murayama, Fumio: *See—*
Hosoda, Minoru; Kasiwagi, Eiichi; Murayama, Fumio; and Isayama, Kohei, 4,104,223, Cl. 260-29.2EP.

Murdock Machine & Engineering Company: *See—*
Herbert, John T.; Kovitch, Frank J.; and Sullivan, Paul E., 4,103,939, Cl. 285-137.00A.

Murphy, Edward J.: *See—*
Anders, Dale F.; Brizgys, Peter V.; Mattiuz, Ronald; and Murphy, Edward J., 4,104,100, Cl. 204-181.00R.
Murray, Pat L.: *See—*
Curtiss, John N.; Koehler, Charles E.; and Murray, Pat L., 4,104,346, Cl. 264-51.000.
Mutter, Walter F.; and Watson, Francis M., III, to Philip Morris Incorporated. Method and apparatus for examining rod-shaped articles. 4,103,535, Cl. 73-37.500.
N.P.I. Corporation: *See—*
Hemborg, Goeran; Green, Winje; Lang-ree, Nils; and Baker, Edward D., 4,103,605, Cl. 99-345.000.
Naarden International N.V.: *See—*
Wille, Hans J., 4,104,202, Cl. 252-522.000.
Nagasawa, Mitsuru; Fujimoto, Teruo; and Tago, Kazuo, to Toyo Soda Manufacturing Co., Ltd. Polymerization of monomer. 4,104,455, Cl. 526-173.000.
Nagase, Mitsuo, to Yoshida Kogyo K.K. Bay window unit. 4,103,466, Cl. 52-201.000.
Nagata, Kunihiro: *See—*
Ito, Tsuneo; Hashiba, Tatuya; Inoue, Takesi; and Nagata, Kunihiro, 4,103,406, Cl. 29-125.000.
Nagel, Robert H.: *See—*
Saylor, Richard; Dalimonte, Alfred A.; and Nagel, Robert H., 4,104,681, Cl. 358-141.000.
Nagy, James A.: *See—*
Martin, Thomas F.; Nagy, James A.; and Scibbe, Harold R., 4,103,842, Cl. 242-107.40A.
Naito, Takayuki; Okumura, Jun; and Iimura, Seiji, to Bristol-Myers Company. 7-(Syn-α-alkoxy-iminofuryl)acetamido-3-(2-methyl-2,3-dihydro-s-triazolo[4,3-b]pyridazin-3-on-6-ylthiomethyl)-3-cephem-4-carboxylic acids. 4,104,469, Cl. 544-27.000.
Naka, Hiromitsu. Anchoring device. 4,103,948, Cl. 292-256.000.
Nakabe, Ryuhei: *See—*
Kitamura, Yoshinori; and Nakabe, Ryuhei, 4,104,679, Cl. 358-44.000.
Nakagawa, Hideki: *See—*
Inagaki, Takeo; Nakagawa, Hideki; and Isa, Hiroshi, 4,104,232, Cl. 260-31.600.
Nakahara, Yutaka: *See—*
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,104,217, Cl. 260-23.0XA.
Nakamichi, Kensuke: *See—*
Miyai, Yukio; Kojo, Takeshi; Takahashi, Junichi; Yoshioka, Satoshi; Nakamichi, Kensuke; Okada, Kozo; and Takeda, Setsuko, 4,104,584, Cl. 324-58.50R.
Nakamura, Ikuo: *See—*
Kobayashi, Osamu; Nakamura, Ikuo; and Shimozono, Akira, 4,103,908, Cl. 277-96.200.
Nakamura, Koyo, to Nissan Motor Company, Ltd. Method and apparatus to control air/fuel ratio of the mixture applied to an internal combustion engine. 4,103,654, Cl. 123-119.0EC.
Nakamura, Nobutaka: *See—*
Murata, Takao; Nakamura, Nobutaka; and Goto, Tateo, 4,104,698, Cl. 361-321.000.
Nakano, Mineo: *See—*
Aimono, Yuji; Omori, Eiji; and Nakano, Mineo, 4,104,215, Cl. 260-22.0CB.
Nakaoka, Ichiro: *See—*
Ando, Wataru; and Nakaoka, Ichiro, 4,104,145, Cl. 204-162.00R.
Nakazawa, Kiwao; and Tanimoto, Akikazu, to Nippon Kogaku K.K. Automatic alignment apparatus. 4,103,998, Cl. 356-152.000.
Nalco Chemical Company: *See—*
Wein, Gary M., 4,104,161, Cl. 210-54.000.
Nali, Robert Ronald: *See—*
Liu, William Chang; Bratton, Francis H.; and Nali, Robert Ronald, 4,104,428, Cl. 428-85.000.
Nanba, Kamori; Ueda, Tomoyuki; and Matsuda, Tetsunori, to Asahi Yukizai Kogyo Kabushiki Kaisha. Ball valve. 4,103,865, Cl. 251-148.000.
Narinsky, Isaak Emmanuilovich: *See—*
Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and Deeva, Alexandra Ivanovna, administratrix, 4,103,745, Cl. 173-57.000.
Nass, Gerald I.: *See—*
Weiss, Marvin; Adams, Phillip; Nass, Gerald I.; and Leitner, Roland L., 4,104,144, Cl. 204-159.230.
Natico, Inc.: *See—*
Heringer, Ronald, 4,103,472, Cl. 53-139.300.
National Distillers and Chemical Corporation: *See—*
Broering, Leo H.; and Duncan, Gary W., 4,104,453, Cl. 526-10.000.
National Presto Industries, Inc.: *See—*
Walker, Duane Hubert, 4,103,801, Cl. 220-203.000.
National Research Development Corporation: *See—*
Schofield, John Wardman, 4,104,585, Cl. 324-58.50C.
Ward, Gerald Frank; and Wray, Gordon Richard, 4,103,636, Cl. 112-266.000.
National Semiconductor Corporation: *See—*
Frederiksen, Thomas M.; Sleeth, Robert S.; and Howard, William M., 4,104,547, Cl. 307-362.000.
National Starch and Chemical Corporation: *See—*
Iovine, Carmine P.; and Ray-Chaudhuri, Dilip K., 4,104,307, Cl. 260-583.00G.
NCR Canada Ltd. - NCR Canada Ltee: *See—*
O'Brien, William L.; and Doran, Wayne M., 4,103,617, Cl. 101-93.030.
Nedza, Donald A., to Met-Pro Corporation. Liquid filter having improved extended polypropylene element. 4,104,170, Cl. 210-487.000.
Nelson, John M.: *See—*
Zagara, Frank A.; and Nelson, John M., 4,103,829, Cl. 239-304.000.
Nelson, Robert C.; Gannon, John Allister; and Shen, Kwan Ting, to Ciba-Geigy Corporation. Process for preparing water-dilutable, heat-curing epoxy resin coating compositions using organic cosolvents. 4,104,224, Cl. 260-29.40R.
Nemoto, Ichiro: *See—*
Tadashi, Nakagawa; Watanabe, Masanori; Onda, Eiichi; Koyama, Mitsuo; and Nemoto, Ichiro, 4,104,665, Cl. 354-226.000.
Neretex Corp.: *See—*
Cornellier, Joseph Rene, 4,103,716, Cl. 139-54.000.
Nethersole, Douglas C.: *See—*
Parthasarathy, Mellapalayam R.; Nethersole, Douglas C.; and Dudley, Michael A., 4,104,416, Cl. 427-29.000.
Neufeld, John A. Sub-trochanteric nail. 4,103,683, Cl. 128-92.0BA.
Neufeldt, Jacob J. Bucket actuating linkage. 4,103,790, Cl. 214-80.000.
New Nippon Electric Co., Ltd.: *See—*
Iwata, Kozo, 4,104,561, Cl. 315-101.000.
Sakamoto, Yoshimasa, 4,103,416, Cl. 29-630.00D.
Newbould, Adrian Orton; Walker, Edward Piper; and Williams, Anthony, to General Electric Company Limited, The. Apparatus for indicating the sequence of alternating current signals. 4,104,586, Cl. 324-83.00D.
Newcor, Inc.: *See—*
Marcin, Richard, 4,103,516, Cl. 64-30.00E.
Newman, Gerald H.: *See—*
Klemann, Lawrence P.; and Newman, Gerald H., 4,104,451, Cl. 429-194.000.
Ngo, Peter Dinh-Tuan, to Bell Telephone Laboratories, Incorporated. Arrangement utilizing the mechanism of charge spreading to provide an ac plasma panel with shifting capability. 4,104,626, Cl. 340-324.00M.
Niagara Blower Company: *See—*
Stutz, Robert C., 4,104,112, Cl. 159-4.00R.
Nicaise, Robert, to Metallurgie Hoboken-Overpelt. Production of zinc powder for electrochemical batteries. 4,104,188, Cl. 252-182.100.
Nichols Institute of Endocrinology, Inc.: *See—*
Young, David M., 4,104,126, Cl. 195-103.50A.
Niday, Louis L., to Niday, Louis L. Mechanical movement mechanism. 4,103,556, Cl. 74-25.000.
Nielson, David R., to E-Systems, Inc. VOR phase monitoring system. 4,104,637, Cl. 343-106.00R.
Nihon Cement Co., Ltd.: *See—*
Kobayashi, Kazuaki; Takaha, Noboru; and Katsuragi, Masao, 4,104,077, Cl. 106-88.000.
Nijhuis, Jan, to Hollandse Signaalapparaten B.V. Dual zone wet drafting device for twistless yarns. 4,103,396, Cl. 19-66.00R.
Nikitin, Jury Ivanovich: *See—*
Fedoseev, Dmitry Valerianovich; Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; Varnin, Valentin Pavlovich; Vnukov, Stanislav Pavlovich; Gerasimenko, Valentin Korneevich; Nikitin, Jury Ivanovich; Tsypin, Nekhemyan Veniaminovich; and Hochko, Anatoly Vasilievich, 4,104,441, Cl. 428-408.000.
Nikolaev, Vladimir Yakovlevich: *See—*
Zdanovsky, Mikhail Romanovich; Minashin, Viktor Vasilievich; Nikolaev, Vladimir Yakovlevich; Razuvaev, Viktor Alexandrovich; Perelygin, Ivan Petrovich; Mikhaevich, Stanislav Leonidovich; and Dridze, Lev Samuilovich, 4,103,915, Cl. 279-119.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Chibana, Masanobu, 4,103,582, Cl. 84-1.240.
Takabayashi, Yojiro, 4,103,583, Cl. 84-291.000.

Nippon Kogaku K.K.: *See—*
Nakazawa, Kiwao; and Tanimoto, Akikazu, 4,103,998, Cl. 356-152.000.
Sugimori, Shiro; and Toyoda, Kenji, 4,104,661, Cl. 354-173.000.
Toyoda, Kenji; and Watanabe, Sakuji, 4,104,666, Cl. 354-234.000.
Nippon Light Metal Company Limited: *See—*
Miki, Isao, 4,104,089, Cl. 148-32.500.
Nippon Pillar Packing Co., Ltd.: *See—*
Inouye, Hiroshi; and Kobayashi, Sadao, 4,103,907, Cl. 277-96.100.
Nippon Riraiansu Kabushiki Kaisha (Japan Reliance Electric Ltd.): *See—*
Tokuno, Masateru; Tanigawa, Hisahiro; Kaneko, Masayoshi; and Shinmura, Noboru, 4,104,723, Cl. 364-475.000.
Nippon Soken, Inc.: *See—*
Hibino, Yoshihiro; Sasaya, Hideaki; and Kobayashi, Akihiro, 4,104,493, Cl. 200-61.45R.
Nippon Steel Corporation: *See—*
Okuda, Hiroji; Washida, Masaaki; and Ide, Hisashi, 4,103,528, Cl. 72-238.000.
Tanikawa, Keiichi; Obi, Tatsuro; Tanaka, Tadashi; Otsuka, Susumu; and Saito, Takao, 4,104,419, Cl. 427-46.000.
Yokokawa, Takao; Takano, Shigeo; Ichinose, Yasuaki; Kasahara, Toshiyuki; and Ikeda, Fumiaki, 4,103,815, Cl. 228-9.000.
Nippon Zeon Co. Ltd.: *See—*
Inoue, Hisaaki; Komai, Hisataka; and Okada, Seiichi, 4,104,327, Cl. 260-876.00B.
Nippondenso Co., Ltd.: *See—*
Kato, Tetsuo; and Mori, Kazumasa, 4,104,560, Cl. 315-83.000.
Matumoto, Eizi; and Norimatsu, Hideaki, 4,103,649, Cl. 123-32.0EE.
Nischk, Gunther: *See—*
Radlmann, Eduard; Gelhaar, Hans-Georg; and Nischk, Gunther, 4,104,324, Cl. 260-857.0TW.
Nishida, Tsuyoshi; Tabushe, Satoshi; and Akeda, Kouichi, to Kubota, Ltd. Horizontal type diesel engine. 4,103,650, Cl. 123-41.860.
Nishikawa, Eiichiroh; Itoh, Takuji; Maeshima, Tsugio; and Kamiyama, Setsuo, to Exxon Research & Engineering Co. Catalyst for reduction of nitrogen oxides and process for preparing the same. 4,104,361, Cl. 423-239.000.
Nishikawa, Masao: *See—*
Sugihara, Hirosada; Watanabe, Masazumi; Motohashi, Michio; Nishikawa, Masao; and Sanno, Yasushi, 4,104,402, Cl. 424-330.000.
Nishimura, Hideo; and Etoh, Kunihiko, to Toyoda-Koki Kabushiki-Kaisha. Dressing apparatus for grinding wheel. 4,103,668, Cl. 125-11.0CD.
Nishioka, Hideya, to Fujitsu Limited. Chip bonding unit. 4,103,814, Cl. 228-6.00A.
Nissan Motor Company, Limited: *See—*
Aono, Shigeo, 4,103,695, Cl. 137-1.000.
Aoyama, Syunichi, 4,103,488, Cl. 60-289.000.
Fujiki, Norio; and Endo, Hiroshi, 4,104,632, Cl. 343-7.0VM.
Hasebe, Tetsuzi, 4,103,714, Cl. 139-1.00C.
Hata, Yoshitaka; Masaki, Kenji; and Ikeura, Kenji, 4,103,486, Cl. 60-274.000.
Iijima, Tetsuya, 4,103,764, Cl. 192-4.00A.
Kobayashi, Osamu; Nakamura, Ikuo; and Shimozono, Akira, 4,103,908, Cl. 277-96.200.
Minami, Hidehiro, 4,103,657, Cl. 123-127.000.
Nakamura, Koyo, 4,103,654, Cl. 123-119.0EC.
Ueno, Zene; Morita, Akira; and Chida, Atushi, 4,103,653, Cl. 123-117.00R.
Yanagishima, Takayuki; and Matsumura, Akira, 4,104,621, Cl. 340-576.000.
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., to Compagnie Francaise des Petroles, Societe Anonyme; Etudes Petrolieres Marines, Societe a Responsabilite Limitee; Ateliers et Chantiers de Bretagne-A.C.B., Societe Anonyme; Compagnie Maritime d'Expertises, Societe Anonyme; Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines (DORIS) Societe Anonyme; and Societe Nationale Elf Aquitaine (Production). Apparatus for connecting the ends of submerged pipes. 4,103,500, Cl. 61-69.00R.
Noguchi, Matsusaburo: *See—*
Watanabe, Akinori; Noguchi, Matsusaburo; and Ota, Toshimichi, 4,103,612, Cl. 101-1.000.
Noguchi, Sadao, to Mitsubishi Jukogyo Kabushiki Kaisha. Method and apparatus for bottling beer. 4,103,721, Cl. 141-6.000.
Nolte, Hans-Henning; De Boel, Marcel; and Baudin, Pol, to BFG Glassgroup. Laminated light-transmitting fire-screening panel. 4,104,427, Cl. 428-68.000.
Nolte, Karl: *See—*
Lundstrom, Goran; and Nolte, Karl, 4,104,490, Cl. 200-44.000.
Nord, Russell H.: *See—*
Rose, Frederick A.; Nord, Russell H.; and Lidicker, Roger E., 4,104,725, Cl. 364-487.000.
Norimatsu, Hideaki: *See—*
Matumoto, Eizi; and Norimatsu, Hideaki, 4,103,649, Cl. 123-32.0EE.
Norland Corporation: *See—*
Rose, Frederick A.; Nord, Russell H.; and Lidicker, Roger E., 4,104,725, Cl. 364-487.000.
Norris, Philip R., to Polaroid Corporation. Camera having automatic shutter recock by film processing mechanism. 4,104,660, Cl. 354-171.000.
North American Philips Corporation: *See—*
Van Roessel, Frederik Johannes, 4,104,678, Cl. 358-30.000.
Northwestern University: *See—*
Meiri, Shmuel, 4,104,006, Cl. 417-334.000.
Norton Company: *See—*
Weaver, Gerald Q., 4,104,062, Cl. 75-238.000.
Norton, Richard S., to Suntech, Inc. Process for N-aroylimides. 4,104,279, Cl. 260-326.00N.
Norwood, Amos: *See—*
Mikes, John A.; Greer, Albert H.; and Norwood, Amos, 4,104,209, Cl. 521-62.000.
Nothdurft, Carl. Fishing reel. 4,103,843, Cl. 242-107.000.
Novello, Frederick C.: *See—*
Baldwin, John J.; and Novello, Frederick C., 4,104,393, Cl. 424-263.000.
Novotny, Donald S.; Marsh, Richard L.; Masters, Frank C.; and Tally, David N., to Goodyear Tire & Rubber Company, The. Microwave devulcanization of rubber. 4,104,205, Cl. 260-2.300.
Nowacki, Georg; and Weber, Karl-Heinz, to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H. Cable carriage and spill-plate housing assembly for a mining machine. 4,103,974, Cl. 299-43.000.
NSK-Warner K.K.: *See—*
Ueda, Takeo, 4,103,845, Cl. 242-107.700.
Nufer, Robert W.: *See—*
Anderson, Leslie C.; Nufer, Robert W.; and Pugliese, Frank G., 4,104,345, Cl. 264-43.000.
Nugent, Adam, Jr.: *See—*
Hornbaker, Edwin D.; and Nugent, Adam, Jr., 4,104,459, Cl. 528-499.000.
Nury, Jean: *See—*
Bernard, Jean Rene; and Nury, Jean, 4,104,320, Cl. 260-673.500.
Obermaier & Cie.: *See—*
Plack, Ludwig, 4,103,523, Cl. 68-187.000.
Obi, Tatsuro: *See—*
Tanikawa, Keiichi; Obi, Tatsuro; Tanaka, Tadashi; Otsuka, Susumu; and Saito, Takao, 4,104,419, Cl. 427-46.000.
O'Brien, William L.; and Doran, Wayne M., to NCR Canada Ltd. - NCR Canada Ltee. Hammer energy impact control using read only memory. 4,103,617, Cl. 101-93.030.
Oetiker, Hans. Hose clamp. 4,103,399, Cl. 24-22.000.
Oetliker, Rudy: *See—*
Richardson, Bruce E.; and Oetliker, Rudy, 4,103,698, Cl. 134-73.000.
Oggioni, Marco; and Rastrelli, Vinicio. Automatic hydraulic machine for preparing infusions, in particular of coffee. 4,103,602, Cl. 99-289.00D.
Ohaji, Cosmas O.: *See—*
Merchant, Philip, Jr.; Powell, F. Luther; and Ohaji, Cosmas O., 4,104,174, Cl. 252-8.55D.
Ohashi, Hiroshi: *See—*
Inoue, Hiromitsu; Katayama, Susumu; and Ohashi, Hiroshi, 4,104,610, Cl. 340-15.000.
Koike, Hiroshi; Wakayama, Hideaki; Ohashi, Hiroshi; and Yokokura, Kunio, 4,104,496, Cl. 200-144.00B.
Ohashi, Yoshinobu; and Inoue, Shizuo, to Kubota, Ltd. Method of making a sand mold. 4,104,347, Cl. 264-113.000.
Ohkubo, Kazuo: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,104,392, Cl. 424-258.000.
Ohm, Klaus, to Chemische Fabrik Dr. Wiedeking. Solderable wire lacquers. 4,104,235, Cl. 260-33.20R.
Ohorodnik, Alexander; Gehrmann, Klaus; Schafer, Stefan; and Mainski, Albert, to Hoechst Aktiengesellschaft. Production of pure methyldichlorophosphane. 4,104,299, Cl. 260-543.00P.
Ohorodnik, Alexander: *See—*
Schafer, Stefan; Gehrmann, Klaus; Ohorodnik, Alexander; Steil, Karl-Heinz; Riechmann, Wernfried; and Bylsma, Friedhelm, 4,104,304, Cl. 260-543.00P.
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Ohtaki, Shohei: *See*—
Tanaka, Katsumi; Hashimoto, Shigeru; Ohtaki, Shohei; Ito, Tadashi; Iwashita, Tomonori; and Kozuki, Susumu, 4,104,649, Cl. 354-289.000.

Oi, Naobumi; Moriguchi, Koichi; and Matsuda, Mari, to Sumitomo Chemical Company, Limited. Use of s-triazine derivatives in a gas chromatographic method. 4,104,040, Cl. 55-67.000.

Okada, Kozo: *See*—
Miyai, Yukio; Kojo, Takeshi; Takahashi, Junichi; Yoshioka, Satoshi; Nakamichi, Kensuke; Okada, Kozo; and Takeda, Setsuko, 4,104,584, Cl. 324-58.50R.

Okada, Morio: *See*—
Hasegawa, Katsumi; Ando, Akio; Yamazaki, Chikayasu; Okada, Morio; Aoi, Norihiro; and Tanbara, Nobuhiko, 4,103,833, Cl. 242-18.00A.

Okada, Seiichi: *See*—
Inoue, Hisaaki; Komai, Hisataka; and Okada, Seiichi, 4,104,327, Cl. 260-876.00B.

Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, to Mitsubishi Chemical Industries Ltd.; and Okamoto, Shosuke. N^2-naphthalenesulfonyl-L-argininamides and the pharmaceutically acceptable salts thereof, and antithrombotic compositions and methods employing them. 4,104,392, Cl. 424-258.000.

Okazaki, Susumu: *See*—
Hayashi, Takeshi; Shibuno, Masao; Sawaki, Chokei; and Okazaki, Susumu, 4,104,075, Cl. 106-44.000.

Oki Electric Industry Co., Ltd.: *See*—
Watanabe, Akinori; Noguchi, Matsusaburo; and Ota, Toshimichi, 4,103,612, Cl. 101-1.000.

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Okorodudu, Abraham O. M.: *See*—
Landis, Phillip S.; and Okorodudu, Abraham O. M., 4,104,181, Cl. 252-46.700.

Okuda, Hiroji; Washida, Masaaki; and Ide, Hisashi, to Koyo Seiko Company, Limited; and Nippon Steel Corporation. Apparatus for releasing drive assembly from driven shaft and connecting same thereto. 4,103,528, Cl. 72-238.000.

Okuda, Yoshihiko: *See*—
Araki, Tsunehiko; and Okuda, Yoshihiko, 4,103,997, Cl. 356-104.000.

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Naito, Takayuki; Okumura, Jun; and Iimura, Seiji, 4,104,469, Cl. 544-27.000.

Okuno, Youichi: *See*—
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Oldendorf, Christian: *See*—
Melcher, Franz Josef; and Oldendorf, Christian, 4,103,750, Cl. 177-1.000.

Oldendorf, William Henry. Method and apparatus for retrieval of exposure information from film images. 4,104,519, Cl. 250-274.000.

Olsen, Robert W., to Construction Specialties, Inc. Drainable blade louver. 4,103,468, Cl. 52-473.000.

Olson, Birger H.; Schuurmans, David M.; Watson, Theodore R.; Shih, Chun-nan; and Cardwell, Burton D., to State of Michigan. Lymphosarcin and method of producing lymphosarcin. 4,104,369, Cl. 424-115.000.

Olympia Werke AG: *See*—
Fischbeck, Karl-Heinz, 4,104,646, Cl. 346-140.00R.

Olympus Optical Co., Ltd.: *See*—
Maitani, Yoshihisa; Shimoyama, Kunio; Yoshida, Muneaki; Hashimoto, Akihiko; and Kitagawa, Masahiro, 4,104,654, Cl. 354-31.000.

Omori, Eiji: *See*—
Aimono, Yuji; Omori, Eiji; and Nakano, Mineo, 4,104,215, Cl. 260-22.0CB.

Onda, Eiichi: *See*—
Tadashi, Nakagawa; Watanabe, Masanori; Onda, Eiichi; Koyama, Mitsuo; and Nemoto, Ichiro, 4,104,665, Cl. 354-226.000.

Onopchenko, Anatoli; Schulz, Johann G.; and Sabourin, Edward T., to Gulf Research & Development Company. Process for preparing novel isomeric dicarboxy, di (hydroxymethyl) diphenylmethane dilactones. 4,104,281, Cl. 260-343.30R.

Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, to Multinorm B.V. Mowing device. 4,103,476, Cl. 56-13.600.

Opalka, Chester J., Jr.: *See*—
Lesher, George Y.; and Opalka, Chester J., Jr., 4,104,385, Cl. 424-250.000.

Oppenlaender, Knut: *See*—
Reuther, Wolfgang; Oppenlaender, Knut; Raff, Paul; Pommer, Ernst-Heinrich; and Siegler, Manfred, 4,104,374, Cl. 424-185.000.

Oratronics, Inc.: *See*—
Weiss, Charles M.; and Judy, Kenneth W. M., 4,103,422, Cl. 32-10.00A.

Orii, Toshio, to Sanyo Electric Co., Ltd. Receiver circuit including an hysteresis circuit for use with a remote controller. 4,104,593, Cl. 325-392.000.

Orlowski, Jan A.: *See*—
Lee, Henry L., Jr.; and Orlowski, Jan A., 4,104,333, Cl. 260-885.000.

Ormat Turbines (1965) Ltd.: *See*—
Bronicki, Yehuda L., 4,104,535, Cl. 290-52.000.

Orr, James Douglas. Ball valve. 4,103,867, Cl. 251-180.000.

Orrell, Leonard; and Whittle, John, to Shell Oil Company. Aviation fuel grade monitor. 4,103,700, Cl. 137-172.000.

Osborne, Harold E.: *See*—
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Ostrander, Kenneth A.: *See*—
Hamby, Russell; and Ostrander, Kenneth A., 4,104,570, Cl. 318-318.000.

Ostyn, Rene. Golfer's stance correcting device. 4,103,897, Cl. 273-188.00A.

Oswald, Alexis A.; and Valint, Paul L., to Ciba-Geigy Corporation. Combatting pests with O,S-dialkyl-O-(4-phenylazophenyl)-thiophosphates. 4,104,378, Cl. 424-225.000.

Ota, Toshimichi: *See*—
Watanabe, Akinori; Noguchi, Matsusaburo; and Ota, Toshimichi, 4,103,612, Cl. 101-1.000.

Otaka, Teruo: *See*—
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Otis Engineering Corporation: *See*—
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O'Toole, Patrick John: *See*—
Damico, Frank M.; and O'Toole, Patrick John, 4,104,710, Cl. 362-130.000.

Otsuka, Susumu: *See*—
Tanikawa, Keiichi; Obi, Tatsuro; Tanaka, Tadashi; Otsuka, Susumu; and Saito, Takao, 4,104,419, Cl. 427-46.000.

Otteson, Nelson Stuart. Gun chamber indicator. 4,103,639, Cl. 42-1.00D.

Ottofrickenstein, Hans: *See*—
Boessler, Hanns; Elser, Wilhelm; Huebner, Klaus; and Ottofrickenstein, Hans, 4,104,227, Cl. 260-29.6HN.

Oude Alink, Bernardus A.; and Thompson, Neil E. S., to Petrolite Corporation. Hexahydropyrimidines as anti-oxidants in natural and synthetic rubbers. 4,104,249, Cl. 260-45.80N.

Ovaska, Juhani: *See*—
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Overzet, John Kenneth, to Borg-Warner Corporation. Signal translating circuit for variable area capacitive pressure transducer. 4,104,595, Cl. 328-1.000.

Owen, Ronald C., to Illinois Tool Works Inc. Article carrier and method of making same. 4,103,811, Cl. 224-45.0AA.

Owens-Corning Fiberglas Corporation: *See*—
Johnson, Carl A., 4,104,434, Cl. 428-273.000.
Roberts, Michael G.; Strauss, Carl R.; and Bolen, Charles E., 4,104,241, Cl. 260-40.00R.

Owston, Ernest H., Jr.: *See*—
Chao, Tai S.; and Owston, Ernest H., Jr., 4,104,036, Cl. 44-56.000.

P.R. Mallory & Co. Inc.: *See*—
Sweany, Louis P.; and Burk, Michael T., 4,104,628, Cl. 340-384.00E.
Weaver, Charles A., 4,104,704, Cl. 361-433.000.

Paal, Gabor: *See*—
Krafft, Werner; Arnold, Gunther; Paal, Gabor; and Vollmer, Hans-Peter, 4,104,067, Cl. 96-1.50R.
Moritz, Holger; and Paal, Gabor, 4,104,070, Cl. 96-36.000.

Pacific Scientific Company: *See*—
Yang, Elmer Chensheng, 4,103,760, Cl. 188-1.00B.

Padilla, Dominick: *See*—
Padilla, Gilbert; and Padilla, Dominick, 4,104,642, Cl. 343-882.000.

Padilla, Gilbert; and Padilla, Dominick, to RMS Electronics, Inc. T-shaped swivel joint for an antenna mounting structure. 4,104,642, Cl. 343-882.000.

Pak-Well Corporation: *See*—
Gartshore, Peter A.; and Ward, James O., 4,103,821, Cl. 229-74.000.

Pako Corporation: *See*—
Charnley, Ralph L.; and Kumpula, Clyde A., 4,104,670, Cl. 354-324.000.

Palagyi, Stanley S.: *See—*
Hanson, James M.; Palagyi, Stanley S.; and Povall, Gerald W., 4,104,706, Cl. 362-10.000.

Palamara, Anthony P. Guide means for boat trailer. 4,103,925, Cl. 280-414.00A.

Panametrics, Inc.: *See—*
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Pandrol Limited: *See—*
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Panelfold Doors, Inc.: *See—*
Dixon, Guy E., 4,103,463, Cl. 52-122.000.

Panlaqui, Clayton E.: *See—*
Holt, Lloyd J.; and Panlaqui, Clayton E., 4,103,849, Cl. 244-63.000.

Panschow, Rudolf: *See—*
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Pape, Rolf: *See—*
Hoffman, Michael; and Pape, Rolf, 4,103,909, Cl. 277-101.000.

Papillon, Bernard: *See—*
Caffarel, Jean-Claude; and Papillon, Bernard, 4,104,186, Cl. 252-89.00R.

Paquette, Elmer G.: *See—*
Dunn, Stanley A.; and Paquette, Elmer G., 4,104,355, Cl. 264-290.00R.

Parcor: *See—*
Ferrand, Gerard; Frehel, Daniel; and Maffrand, Jean-Pierre, 4,104,390, Cl. 424-256.000.

Parent, Jean-Marc. Camping vehicle body. 4,103,958, Cl. 296-23.00C.

Park, Kyu C.; and Weitzman, Elizabeth J., to International Business Machines Corporation. Glass layer fabrication. 4,104,418, Cl. 427-42.000.

Parker, Robert J., to Ford Motor Company. Pivot construction for a motor vehicle suspension system. 4,103,932, Cl. 280-718.000.

Parrillo, Henry; Harrington, John Sherman; and Curtis, Glenn Howard, to Marshall and Williams Company. Tenter guide rail gap crossing mechanism. 4,103,403, Cl. 26-91.000.

Parsons, Michael Edward: *See—*
Black, James Whyte; and Parsons, Michael Edward, 4,104,382, Cl. 424-247.000.

Parthasarathy, Mellapalayam R.; Nethersole, Douglas C.; and Dudley, Michael A., to Canada Wire and Cable Limited. Thin walled protective coatings by electrostatic powder deposition. 4,104,416, Cl. 427-29.000.

Partilla, John David: *See—*
Baker, Robert Lee; Mahoski, Calvin Michael; Partilla, John David; and Ronan, Harold Robert, Jr., 4,104,589, Cl. 324-158.00F.

Parziale, Ernest A.; and Richardson, Dennis C., to Westinghouse Electric Corp. Nuclear reactor power generation. 4,104,117, Cl. 176-20.00R.

Passal, Frank; Lash, Ronald J.; and Kardos, Otto, to M&T Chemicals Inc. Brass plating. 4,104,138, Cl. 204-44.000.

Patel, Mahendra K.: *See—*
Chan, Kingsley; Patel, Mahendra K.; and Wolkin, Sidney, 4,104,713, Cl. 362-294.000.

Patel, Raman P.: *See—*
Coran, Aubert Y.; and Patel, Raman P., 4,104,210, Cl. 260-4.00R.

Paterson, David James: *See—*
Banks, Reginald George Sinclair; Paterson, David James; and Williams, Alan, 4,104,201, Cl. 252-466.00B.

Patterson, W. W., III; and Grapes, Eugene F. Wire rope binder. 4,103,871, Cl. 254-164.000.

Paul, Dwaine M., to Moran, Thomas L., a part interest. Method and means of treating water wells. 4,103,743, Cl. 166-299.000.

Pauley, Eugene E. Fireplace heat exchanger assembly. 4,103,669, Cl. 126-121.000.

Paulson, Larry G.: *See—*
Karacan, Ismet; Paulson, Larry G.; and Timm, Gerald W., 4,103,678, Cl. 128-2.05V.

Paulus, Rudolf: *See—*
Vanheerentals, Jacques Leon; Pfeifer, Josef; Klocke, Helmut; and Paulus, Rudolf, 4,104,069, Cl. 96-23.000.

Payet, George Louis, to Strike Corporation, The. Durable press process for cellulosic fiber-containing fabrics utilizing formaldehyde and a water soluble liquid or gaseous acid catalyst. 4,104,022, Cl. 8-115.600.

Paz, Eldad: *See—*
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Peabody, Edwin A., deceased; and by Peabody, Gertrude A., administratrix. Bogie wheel. 4,103,558, Cl. 74-230.700.

Peabody, Gertrude A., administratrix: *See—*
Peabody, Edwin A., deceased; and Peabody, Gertrude A., administratrix, 4,103,558, Cl. 74-230.700.

Pearce, Arthur R., to Key Industries. Punch for compressing machine. 4,104,014, Cl. 425-345.000.

Pearce, Ralph Reginald, to E M I Limited. Magnetic recording. 4,104,513, Cl. 235-450.000.

Pearl-Wick Corporation: *See—*
Silverstein, Sidney, 4,103,805, Cl. 220-331.000.

Pech, David J.: *See—*
Beduhn, Daniel E.; Morrow, James G., Sr.; and Pech, David J., 4,103,783, Cl. 212-48.000.

Pecsi, Louis E., to Eaton Corporation. Starter motor protector circuit. 4,104,688, Cl. 361-28.000.

Pedersen, Kristen I.: *See—*
Kiely, William L.; and Pedersen, Kristen I., 4,103,942, Cl. 285-276.000.

Pedersen, Tor Jan: *See—*
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Peer, John Charles; and Luz, David Warren, to RCA Corporation. Television raster width regulation circuit. 4,104,567, Cl. 315-387.000.

Peets, Robert S.: *See—*
Frank, Carl S.; Grzybowski, John J.; and Peets, Robert S., 4,103,633, Cl. 112-217.100.

Pelikan, Hans Dieter; and Titz, Siegfried, to Pelikan, Hans Dieter; and Titz, Siegfried. Process for production of cellular cavities in thermoplastic material in which the medium which forms the gas bubbles is bound to a carrier. 4,104,207, Cl. 521-84.000.

Pellant, Michal: *See—*
Kovar, Jiri; Kafunek, Pavel; Reichel, Pavel; Pokorny, Oldrich; Pellant, Michal; Kratina, Jindrich; and Zuna, Jaroslav, 4,104,677, Cl. 357-81.000.

Pelsy, Gilles. Linkage for an excavating tooth. 4,103,443, Cl. 37-193.000.

Penhorwood, Herbert F., to Universal Electric Company. Motor seals. 4,104,550, Cl. 310-71.000.

Pennell, Phillip E., to Gates Rubber Company, The. Method of using a flexible mandrel for making a locking cable. 4,103,410, Cl. 29-403.000.

Penton, Allen P., III: *See—*
Gonzalez, Rodolfo; and Penton, Allen P., III, 4,104,426, Cl. 428-36.000.

Peoples, Jake E.: *See—*
Mesny, Philip R.; and Peoples, Jake E., 4,103,869, Cl. 254-86.00R.

Perelygin, Ivan Petrovich: *See—*
Zdanovsky, Mikhail Romanovich; Minashin, Viktor Vasilievich; Nikolaev, Vladimir Yakovlevich; Razuvaev, Viktor Alexandrovich; Perelygin, Ivan Petrovich; Mikhaevich, Stanislav Leonidovich; and Dridze, Lev Samuilovich, 4,103,915, Cl. 279-119.000.

Perez, Hector R. Multi-purpose working vehicle. 4,103,799, Cl. 214-86.00A.

Perfect, Frederick H., to Reading Alloys, Inc. Molybdenum-titanium-zirconium-aluminum master alloys. 4,104,059, Cl. 75-134.00F.

Perkin-Elmer Corporation, The: *See—*
Staunton, John J. J., 4,103,643, Cl. 118-50.000.

Perkins, Calvin C., to Marantz Company, Inc. Heat exchanger structure for electronic apparatus. 4,103,737, Cl. 165-80.000.

Persson, Sven Erik, to Teknisk Konsult Sven Persson AB. Conveyor for conveying articles in a helically curved path. 4,103,768, Cl. 198-778.000.

Pessel, David; and Wilhelm, Neil C. Telephone loud-speaker system. 4,104,485, Cl. 179-1.0HF.

Peters, Anthony J., to Sonoco Products Company. Loom core. 4,103,837, Cl. 242-46.210.

Peters, Kenneth D.: *See—*
Veinerman, Elliot; Felch, Donald E.; and Peters, Kenneth D., 4,104,149, Cl. 208-64.000.

Peters, Victor; and Krammer, Franz, to ALKOR Gesellschaft mit beschrankter Haftung Kunststoffverkauf. Printing ink. 4,104,219, Cl. 260-29.6RB.

Peterson, Soren E. Apparatus for forming cleats on belting. 4,104,094, Cl. 156-500.000.

Petrellis, Nicholas C.: *See—*
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Petrolite Corporation: *See—*
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Redmore, Derek; and Welge, Frederick T., 4,104,293, Cl. 260-438.50R.

Pettelkau, Hans-Jurgen, to Bayer Aktiengesellschaft. Process for the production of concentrated polychloroprene latices. 4,104,272, Cl. 260-27.0BB.

Pfahler, Gerhard: *See—*
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Pfeuffer, Alfred, to Messer Griesheim GmbH. Device for the flame treatment of a work-piece. 4,103,877, Cl. 266-51.000.

Pfreizer, Mel A.: *See—*
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Philip Morris Incorporated: *See—*
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Phillips, Bernard L., to Arrow Hart Inc. Process for soldering to laminations of an arcing contact for a high current switch. 4,104,506, Cl. 219-85.0CM.

Phillips Fibers Corporation: *See—*
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Phillips Petroleum Company: *See—*
Doss, Richard C., 4,104,350, Cl. 264-225.000.
Fodor, Lawrence M., 4,104,326, Cl. 260-876.00B.
Howerton, John M., 4,103,505, Cl. 61-108.000.
Meyer, Richard D., 4,104,015, Cl. 425-382.200.
Snavely, Kenneth E., 4,104,322, Cl. 260-827.000.
Snavely, Kenneth E., 4,104,334, Cl. 260-888.000.
Swanson, Billy L., 4,103,742, Cl. 166-282.000.
Zelinski, Robert P., 4,104,332, Cl. 260-880.00B.

Photon Power, Inc.: *See—*
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Piattoni, Louis J.: *See—*
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Pick, Peter, to Knorr-Bremse GmbH. Two-pressure brake control valve for single stage releasing indirectly acting airbrakes. 4,103,976, Cl. 303-38.000.

Picou, Jean-Loup: *See—*
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Pike, Roscoe A., to Union Carbide Corporation. Organofunctional silicon compounds. 4,104,296, Cl. 260-448.80R.

Piltz, Lars-Eric; and Jeppsson, Jan-Bertil, to AB Akerlund & Rausing. Closure for a container. 4,103,802, Cl. 220-258.000.

Pirelli Furlanis - Applicazioni Idrauliche Agricole Gomma S.p.A.: *See—*
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Colamussi, Arturo; and Merli, Vittorio, 4,103,497, Cl. 61-27.000.

Pittaro, Richard J.: *See—*
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Pittsburgh Corning Corporation: *See—*
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Plack, Ludwig, to Obermaier & Cie. Apparatus for dyeing flocked textile fibers. 4,103,523, Cl. 68-187.000.

Plan Partitions Limited: *See—*
Booker, Ernest R., 4,103,458, Cl. 49-56.000.

Plank, Charles J.: *See—*
Rubin, Mae K.; Plank, Charles J.; and Rosinski, Edward J., 4,104,151, Cl. 208-111.000.

Planken, Heinz: *See—*
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Plastics, Inc.: *See—*
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Plessey Handel und Investments AG.: *See—*
Smith, Richard Hanley; and Laws, Peter Graham, 4,104,714, Cl. 363-21.000.

Pliml, Frank V.; and Erickson, Lloyd A., to Illinois Tool Works Inc. Support fastener. 4,103,854, Cl. 248-235.000.

Pliml, Frank V., Jr., to Illinois Tool Works Inc. Gravity actuated light socket and switch means. 4,104,492, Cl. 200-51.140.

Pogge, Hans Bernhard, to International Business Machines Corporation. Total dielectric isolation utilizing a combination of reactive ion etching, anodic etching, and thermal oxidation. 4,104,090, Cl. 148-175.000.

Pogge, Hans Bernhard: *See—*
Bondur, James Allan; and Pogge, Hans Bernhard, 4,104,086, Cl. 148-1.500.

Pohl, Dieter; and Redlinger, Franz, to Schwabische Huttenwerke Gesellschaft mit beschrankter Haftung. Formed part of sintered iron and method and sintering tile for making same. 4,104,063, Cl. 75-243.000.

Poirier, Victor L., to Thermo Electron Corporation. Pneumatic bladder pump having stiffness symmetry. 4,104,005, Cl. 417-394.000.

Pokorny, Oldrich: *See—*
Kovar, Jiri; Kafunek, Pavel; Reichel, Pavel; Pokorny, Oldrich; Pellant, Michal; Kratina, Jindrich; and Zuna, Jaroslav, 4,104,677, Cl. 357-81.000.

Polaroid Corporation: *See—*
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Friedman, Harvey S., 4,104,669, Cl. 354-304.000.
Huyffer, Paul S., 4,104,269, Cl. 260-162.000.
Johnson, Bruce K.; and Whiteside, George D., 4,104,653, Cl. 354-27.000.
Norris, Philip R., 4,104,660, Cl. 354-171.000.
Schreiber, Karl J., 4,104,068, Cl. 96-3.000.
Thomas, Paul W., 4,103,569, Cl. 74-816.000.

Pollitt, John Michael: *See—*
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Polster, Rudolf: *See—*
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Polychrome Corporation: *See—*
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Pommer, Ernst-Heinrich; Gutsche, Klaus; and Hartleben, York, to BASF Aktiengesellschaft. Triazole derivatives. 4,104,399, Cl. 424-269.000.

Pommer, Ernst-Heinrich: *See—*
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Pons, Andre, to Saint-Gobain Industries. Manufacture of novel grey and bronze glasses. 4,104,076, Cl. 106-52.000.

Pons, Benoit-Joseph: *See—*
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Pont-A-Mousson S.A.: *See—*
Hubbard, Donald Arthur, 4,104,354, Cl. 264-262.000.

Pooler, John Dennis, to Thomas J. Lipton, Inc. Forming of ice lollies and other confections. 4,104,411, Cl. 426-421.000.

Pope, Bill J.; Horton, M. Duane; and Hall, H. Tracy, to Brigham Young University. High thermal conductivity substrate. 4,104,344, Cl. 264-42.000.

Pope, George N.: *See—*
Mitsche, Roy T.; and Pope, George N., 4,104,154, Cl. 208-138.000.

Porter, Raymond P., to Acushnet Company. Method of forming improved windshield wiper blades. 4,103,385, Cl. 15-250.360.

Poublan, Alain; Bachman, Charles; and Bouvard, Jacques, to Compagnie Honeywell Bull (Societe Anonyme). System for protecting shared files in a multiprogrammed computer. 4,104,718, Cl. 364-200.000.

Poulson, Roger: *See—*
Prouse, Ronald Ernest; West, Anthony Alfred; King, Derek Anthony; and Poulson, Roger, 4,104,115, Cl. 162-100.000.

Povall, Gerald W.: *See—*
Hanson, James M.; Palagyi, Stanley S.; and Povall, Gerald W., 4,104,706, Cl. 362-10.000.

Powell, F. Luther: *See—*
Merchant, Philip, Jr.; Powell, F. Luther; and Ohaji, Cosmas O., 4,104,174, Cl. 252-8.55D.

Powercube Corporation: *See—*
Baranowski, Conrad J., 4,104,701, Cl. 361-386.000.

Powers Chemco, Inc.: *See—*
Crissy, Robert J., 4,104,071, Cl. 96-41.000.

PPG Industries, Inc.: *See—*
Chang, Wen-Hsuan; Schimmel, Karl F.; and Claar, James A., 4,104,230, Cl. 260-29.6NR.
Marchetti, Joseph R.; Zwack, Robert R.; and Jerabek, Robert D., 4,104,147, Cl. 204-181.00C.
Seymour, Samuel L., 4,104,047, Cl. 65-273.000.

Prasch, Johann, to Klockner-Humboldt-Deutz Aktiengesellschaft. Lubricating device for internal combustion engines. 4,103,665, Cl. 123-196.00R.

Pressman, Gerald L.; and Wilk, Louis. Concealed pattern detection game. 4,103,895, Cl. 273-153.00R.

Price, Michael G.: *See—*
Brooker, Gary; Terasaki, Wesley L.; and Price, Michael G., 4,104,026, Cl. 23-230.00B.

Price, Raymond: *See—*
Hall, Nigel; Price, Raymond; and Rowbotham, Philip Martin, 4,104,270, Cl. 260-205.000.

Priesemuth, Wolfgang. Windshield wiper. 4,103,384, Cl. 15-250.030.

Prikhna, Alexei Iosifovich: *See—*
Fedoseev, Dmitry Valerianovich; Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; Varnin, Valentin Pavlovich; Vnukov, Stanislav Pavlovich; Gerasimenko, Valentin Korneevich; Nikitin, Jury Ivanovich; Tsypin, Nekhemyan Veniaminovich; and Hochko, Anatoly Vasilievich, 4,104,441, Cl. 428-408.000.

Product Design & Engineering Corp.: *See—*
Kelly, Eugene R.; and Gould, Donald M., 4,104,013, Cl. 425-324.100.

Produits Chimiques Ugine Kuhlmann: *See—*
Sleziona, Joseph; and Demarcq, Michel, 4,104,309, Cl. 260-606.50P.

Proskurin, Leonid Leonidovich: *See—*
Chuchin, Alexandr Evgenievich; and Proskurin, Leonid Leonidovich, 4,104,244, Cl. 260-45.70R.
Proto Production Plastics, Inc.: *See—*
Hotchkiss, Kenneth W., 4,104,703, Cl. 361-426.000.
Proud, Joseph M., Jr.; and Fallier, Charles N., Jr., to GTE Laboratories Incorporated. High energy radio frequency pulse generators. 4,104,556, Cl. 315-39.000.
Proud, Joseph M., Jr., to GTE Laboratories Incorporated. Liquid dielectric radio frequency pulse generators. 4,104,557, Cl. 315-39.000.
Proud, Joseph M., Jr.; and McNeill, William H., to GTE Laboratories Incorporated. Tunable radio frequency pulse generators. 4,104,558, Cl. 315-39.000.
Prough, James R.: *See—*
Sherman, Michael I.; and Prough, James R., 4,104,113, Cl. 162-19.000.
Prouse, Ronald Ernest; West, Anthony Alfred; King, Derek Anthony; and Poulson, Roger, to Carreras Rothmans, Limited. Method of making paper from water insoluble alginate fibers and the paper produced. 4,104,115, Cl. 162-100.000.
Pugliese, Frank G.: *See—*
Anderson, Leslie C.; Nufer, Robert W.; and Pugliese, Frank G., 4,104,345, Cl. 264-43.000.
Purdue Frederick Company, The: *See—*
Cohen, Sasson; and Fisher, Abraham, 4,104,397, Cl. 424-267.000.
Puretic, Mario J. Fish unloading system. 4,103,792, Cl. 214-152.000.
Pusztaszeri, Stephen F. Poly-2-pyrrolidone prepared with inert drying agent. 4,104,260, Cl. 528-323.000.
Putt, James Basil, to Bendix Corporation, The. Filter for a servomotor. 4,103,590, Cl. 91-376.00R.
Q-dot Corporation: *See—*
Taylor, James R., 4,103,433, Cl. 34-86.000.
Quaker Oats Company, The: *See—*
Dunlop, Andrew P., 4,103,729, Cl. 164-12.000.
Quenot, Michel, to Stanley-Mabo S.A. Blade-holding cutting device. 4,103,421, Cl. 30-162.000.
Quettier, Annick: *See—*
Lansiart, Alain; Gaucher, Jean-Claude; Lequais, Jean; Moretti, Jean-Luc; and Quettier, Annick, 4,103,677, Cl. 128-2.00V.
R. E. Dietz Company: *See—*
Hunter, Everest C., 4,104,615, Cl. 340-84.000.
Rabinow, Jacob, to Hall & Myers, a part interest. Method of and apparatus for making a sheet metal zig-zag key. 4,103,570, Cl. 76-110.000.
Radlmann, Eduard; Gelhaar, Hans-Georg; and Nischk, Gunther, to Bayer Aktiengesellschaft. Deep-dyeing polycaprolactam fibres and filaments. 4,104,324, Cl. 260-857.0TW.
Radloff, Frederick J.: *See—*
Krolak, Ronald F.; and Radloff, Frederick J., 4,103,985, Cl. 339-126.00R.
Radwill, Robert P., to AMSTED Industries Incorporated. Squaring frictionally snubbed railway car truck. 4,103,623, Cl. 105-197.0DB.
Raff, Paul: *See—*
Reuther, Wolfgang; Oppenlaender, Knut; Raff, Paul; Pommer, Ernst-Heinrich; and Siegler, Manfred, 4,104,374, Cl. 424-185.000.
Rahman, Abdul R.; and Deneke, Wayne A., to United States of America, Army. Process of making dehydrated fruit juice. 4,104,414, Cl. 426-599.000.
Rakowsky, Frederick W.: *See—*
Meguerian, Garbis H.; and Rakowsky, Frederick W., 4,104,360, Cl. 423-213.200.
Ralph M. Parsons Co.: *See—*
Brocoff, Jack, 4,104,191, Cl. 252-188.000.
Rank Xerox, Ltd.: *See—*
Sudo, Katsumi; and Kanazawa, Yukio, 4,104,692, Cl. 361-106.000.
Rapson, W. Howard: *See—*
Rowlandson, Gordon; Reeve, Douglas W.; and Rapson, W. Howard, 4,104,114, Cl. 162-29.000.
Rasp, Christian: *See—*
Botta, Artur; and Rasp, Christian, 4,104,194, Cl. 252-390.000.
Rastrelli, Vinicio: *See—*
Oggioni, Marco; and Rastrelli, Vinicio, 4,103,602, Cl. 99-289.00D.
Ratz, Walter; and Lindemann, Werner, to Bergwerksverband GmbH. Remote control of a mobile underground machine, particularly in a mine. 4,104,592, Cl. 325-37.000.
Raubenheimer, Wallace O. Carton divider. 4,103,818, Cl. 229-15.000.
Raue, Roderich: *See—*
Dorsch, Hans-Lothar; and Raue, Roderich, 4,104,268, Cl. 260-158.000.
Ray-Chaudhuri, Dilip K.: *See—*
Iovine, Carmine P.; and Ray-Chaudhuri, Dilip K., 4,104,307, Cl. 260-583.00G.
Rayfield, Wilson Parker; and Jurgensen, Robert H., to Burroughs Corporation. Automatic overlay attaching apparatus. 4,104,105, Cl. 156-364.000.
Rayment, Larry W.; and Kilbourn, Thomas S., to Eaton Corporation. Method of hard surfacing by plasma torch. 4,104,505, Cl. 219-76.160.
Raymond Lee Organization, Inc., The: *See—*
Chaput, Stanley H., 4,104,613, Cl. 340-52.00D.
Fulton, Frank F., 4,103,898, Cl. 273-248.000.
Stech, Don W., 4,104,148, Cl. 204-242.000.
Treasarden, Robert J., 4,103,890, Cl. 273-1.00E.
Raynaud, Guy M.: *See—*
Fauran, Claude P.; Turin, Michel J.; Imbert, Thierry F.; Raynaud, Guy M.; and Dorme, Nicole A. M., 4,104,384, Cl. 424-248.510.
Razuvaev, Viktor Alexandrovich: *See—*
Zdanovsky, Mikhail Romanovich; Minashin, Viktor Vasilievich; Nikolaev, Vladimir Yakovlevich; Razuvaev, Viktor Alexandrovich; Perelygin, Ivan Petrovich; Mikhaevich, Stanislav Leonidovich; and Dridze, Lev Samuilovich, 4,103,915, Cl. 279-119.000.
RCA Corporation: *See—*
Baker, Robert Lee; Mahoski, Calvin Michael; Partilla, John David; and Ronan, Harold Robert, Jr., 4,104,589, Cl. 324-158.00F.
Forster, Gerhard; and Bohringer, Walter, 4,104,569, Cl. 315-408.000.
Peer, John Charles; and Luz, David Warren, 4,104,567, Cl. 315-387.000.
Riley, George Andrew, 4,103,483, Cl. 58-90.00R.
Reading Alloys, Inc.: *See—*
Perfect, Frederick H., 4,104,059, Cl. 75-134.00F.
Readymatie S.A.: *See—*
Robuchon-Merovak, Romain Gabriel; and Robuchon-Merovak, Christian Romain, 4,104,031, Cl. 23-253.00R.
Reagan, Rose M. Hair arranging accessory. 4,103,693, Cl. 132-46.00R.
Recortec, Inc.: *See—*
Chang, David T. L., 4,104,685, Cl. 360-84.000.
Reddekopp, Aaron. Truck engine air preheating system. 4,103,656, Cl. 123-122.00D.
Redlinger, Franz: *See—*
Pohl, Dieter; and Redlinger, Franz, 4,104,063, Cl. 75-243.000.
Redmore, Derek; and Welge, Frederick T., to Petrolite Corporation. Oil-soluble chromium compositions. 4,104,293, Cl. 260-438.50R.
Rees, Peter William, to Measurex Corporation. Apparatus for measuring the weight per unit length of a cigarette rod. 4,104,522, Cl. 250-359.000.
Reese, Paul T., to Tecumseh Products Company. Pull-rope recoil starter. 4,103,660, Cl. 123-179.00K.
Reeve, Douglas W.: *See—*
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Reichel, Pavel: *See—*
Kovar, Jiri; Kafunek, Pavel; Reichel, Pavel; Pokorny, Oldrich; Pellant, Michal; Kratina, Jindrich; and Zuna, Jaroslav, 4,104,677, Cl. 357-81.000.
Reiersdal, Olav L. Device for a hydraulically driven percussion hammer. 4,103,591, Cl. 91-417.00R.
Reimann, Siegfried: *See—*
Hoffmann, Ernst; Reimann, Siegfried; and Aschermann, Heinz, 4,104,008, Cl. 417-397.000.
Reizman, Fremont: *See—*
Lewis, John H.; Lewis, Kathrine J.; Reizman, Fremont; and Welkowsky, Murray S., 4,104,520, Cl. 250-315.00R.
Reliable Electric Company: *See—*
Toda, Toshiharu; and Shigemori, Daizo, 4,104,693, Cl. 361-120.000.
Reliance Electric Company: *See—*
Hamby, Russell; and Ostrander, Kenneth A., 4,104,570, Cl. 318-318.000.
Rellensmann, Wolfgang; Bueb, Michael; Rupprecht, Lothar; Schmidt, Herbert; and Wagner, Wolfram, to Bayer Aktiengesellschaft. Method for producing textured filament yarns with improved yarn qualities from preorientated polyamide 6. 4,103,480, Cl. 57-140.00R.
Remy, David C., to Merck & Co., Inc. 3-Lower alkoxycycloheptadines as serotonin inhibitors. 4,104,398, Cl. 424-267.000.
Rengo Co., Ltd.: *See—*
Tokuno, Masateru, 4,103,786, Cl. 214-7.000.
Rengo Kabushiki Kaisha (Rengo Co., Ltd): *See—*
Tokuno, Masateru; Tanigawa, Hisahiro; Kaneko, Masayoshi; and Shinmura, Noboru, 4,104,723, Cl. 364-475.000.
Repa Feinstanzwerk GmbH: *See—*
Martin, Thomas F.; Nagy, James A.; and Scibbe, Harold R., 4,103,842, Cl. 242-107.40A.
Research Corporation: *See—*
Fox, Jack J.; and Burchenal, Joseph H., 4,104,461, Cl. 536-23.000.
Resnick, Marvin; and Mounts, Stanley Homer, to Textile Associates, Inc. Cleaning unit. 4,103,389, Cl. 15-302.000.
Retzer, Erich, to Compur-Werk Gesellschaft mit beschrankter Haftung & Co. Method of preparing liquid samples for testing. 4,104,025, Cl. 23-230.00R.

Reuther, Wolfgang; Oppenlaender, Knut; Raff, Paul; Pommer, Ernst-Heinrich; and Siegler, Manfred, to BASF Aktiengesellschaft. Wood preservative. 4,104,374, Cl. 424-185.000.

Reuting, Hans-Werner, to Elmeg Elektro-Mechanik GmbH. Method of adjusting a permanent magnet by using a hypothetical demagnetization curve lower than the actual value. 4,104,591, Cl. 324-205.000.

Rexnord Inc.: *See*—
Klatt, Kenneth G.; and Robnolt, Leon D., Jr., 4,103,771, Cl. 206-219.000.

Reynolds, Lionel Arthur, to A. F. Hydraulics Limited. Rotary and percussive devices. 4,103,746, Cl. 173-107.000.

Reynolds Metals Company: *See*—
Schardein, Daniel Joseph; and Lloyd, Ruth Diane, 4,104,136, Cl. 204-38.00B.

Rhode, Richard: *See*—
Graham, Gordon L., 4,103,495, Cl. 61-12.000.

Rhone-Poulenc Industries: *See*—
Bargain, Michel; and Lagarde, Robert, 4,104,239, Cl. 260-37.0SB.
Barreau, Michel; Cotrel, Claude; and Jeanmart, Claude, 4,104,386, Cl. 424-250.000.
Caffarel, Jean-Claude; and Papillon, Bernard, 4,104,186, Cl. 252-89.00R.
Linguenheld, Louis, 4,104,237, Cl. 260-37.0SB.

Rhone-Progil: *See*—
Debord, Daniel; and Soussan, Salomon, 4,104,457, Cl. 526-203.000.

Rhyne, Ralph H.; and Wise, Dan S., to Wise Industries, Inc. Method and apparatus for blending textile fibers. 4,103,398, Cl. 19-145.500.

Riblet, Henry. Adjustable scaffold bracket. 4,103,856, Cl. 248-246.000.

Rice Hydro Equipment Manufacturing: *See*—
Victor, Floyd Ray, 4,103,537, Cl. 73-40.50R.

Richards, Donald L., to Eaton Corporation. Safety relief valve. 4,103,704, Cl. 137-522.000.

Richardson, Bruce E.; and Oetliker, Rudy, to Labatt Breweries of Canada Limited. Bottle label removing device. 4,103,698, Cl. 134-73.000.

Richardson, Dennis C.: *See*—
Parziale, Ernest A.; and Richardson, Dennis C., 4,104,117, Cl. 176-20.00R.

Richmond, Raymond. Clamping devices. 4,103,380, Cl. 9-30.000.

Richtzenhain, Hermann: *See*—
Zoche, Gunter; Richtzenhain, Hermann; and Vogt, Wilhelm, 4,104,300, Cl. 260-544.00D.

Ricketts, Joseph H. Golf tee. 4,103,888, Cl. 273-33.000.

Ricoh Co., Ltd.: *See*—
Tsubuko, Kazuo; and Kizu, Yasuo, 4,104,183, Cl. 252-62.10L.

Ridenour, Charles E.; Fabert, Herman A., Jr.; Tasker, John; and Larson. Hugo R., to Abex Corporation. Welding manganese steel. 4,104,504, Cl. 219-73.100.

Ridgway, H. Curtis, to Telsco Industries, Inc. Rotary sprinkler impact arm spring adjustment. 4,103,828, Cl. 239-206.000.

Riebel, Hans-Jochem: *See*—
Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; and Lurssen, Klaus, 4,104,049, Cl. 71-76.000.

Riechmann, Wernfried: *See*—
Schafer, Stefan; Gehrmann, Klaus; Ohorodnik, Alexander; Steil, Karl-Heinz; Riechmann, Wernfried; and Bylsma, Friedhelm, 4,104,304, Cl. 260-543.00P.

Riedel-de Haen Aktiengesellschaft: *See*—
Hertwig, Askan; and Krampitz, Horst, 4,104,189, Cl. 252-186.000.

Rieppel, Perry J.; and Henderson, Harold Richard, to Arcair Company. Noise suppressing welding helmet. 4,103,359, Cl. 2-8.000.

Righter, Richard G.: *See*—
Alvarado, Jim; and Righter, Richard G., 4,103,944, Cl. 289-18.000.

Riker Laboratories, Inc.: *See*—
Hammar, Walton J., 4,104,475, Cl. 560-56.000.

Riley, George Andrew, to RCA Corporation. Electronic wristwatch. 4,103,483, Cl. 58-90.00R.

Rilling, Raymond J.: *See*—
Mullet, David; Rilling, Raymond J.; and Voth, Elmer D., 4,103,477, Cl. 56-202.000.

Riordan, David B. Inflatable structure. 4,103,369, Cl. 4-172.120.

Rittenhouse, Howard E., to Liquid Controls Corporation. Safety interlock system for preset counters. 4,104,511, Cl. 235-132.00R.

RMS Electronics, Inc.: *See*—
Padilla, Gilbert; and Padilla, Dominick, 4,104,642, Cl. 343-882.000.

Robbins, Charles D.: *See*—
Wang, Shih-Ping; Robbins, Charles D.; and Merritt, Elisha, 4,104,516, Cl. 250-213.0VT.

Robert Bosch GmbH: *See*—
Adalbert, Gerhard; Hess, Jurgen; and Hecht, Ulrich, 4,103,506, Cl. 62-61.000.
Juhasz, Josef, 4,104,580, Cl. 324-29.500.
Seiler, Hartmut, 4,104,546, Cl. 307-362.000.
Uebel, Philip, 4,104,001, Cl. 404-133.000.

Roberts, Marion L.; Sharpe, Max H.; and Krupnick, Albert C., to United States of America, National Aeronautics and Space Administration. Method for making an aluminum or copper substrate panel for selective absorption of solar energy. 4,104,134, Cl. 204-37.00R.

Roberts, Michael G.; Strauss, Carl R.; and Bolen, Charles E., to Owens-Corning Fiberglas Corporation. Thermosetting additives for polyester-based molding compounds. 4,104,241, Cl. 260-40.00R.

Roberts, Sidney G., to Kaiser Aluminum & Chemical Corporation. Powder metallurgy. 4,104,061, Cl. 75-211.000.

Robin, Rollin. Apparatus for converting a measuring tape to a compass. 4,103,426, Cl. 33-27.00C.

Robinson, Bernie E., to Milwaukee Valve Company, Inc. Butterfly valve. 4,103,866, Cl. 251-151.000.

Robinson, Glen P., Jr.; Shelton, Samuel V.; and Hutchins, Samuel F., to Scientific-Atlanta, Inc. Modular solar collector system. 4,103,674, Cl. 126-271.000.

Robinson, John C.: *See*—
Tucker, Samuel M., 4,103,390, Cl. 28-173.000.

Robnolt, Leon D., Jr.: *See*—
Klatt, Kenneth G.; and Robnolt, Leon D., Jr., 4,103,771, Cl. 206-219.000.

Robuchon-Merovak, Christian Romain: *See*—
Robuchon-Merovak, Romain Gabriel; and Robuchon-Merovak, Christian Romain, 4,104,031, Cl. 23-253.00R.

Robuchon-Merovak, Romain Gabriel; and Robuchon-Merovak, Christian Romain, to Readymatic S.A. Apparatus for displaying the results obtained on an agglutination support. 4,104,031, Cl. 23-253.00R.

Rock, Erich; and Mages, Bernhard, to Julius Blum Gesellschaft m.b.H. Door hinge. 4,103,394, Cl. 16-129.000.

Rockwell-Golde G.m.b.H.: *See*—
Schlapp, Albert, 4,103,962, Cl. 296-137.00E.

Rockwell International Corporation: *See*—
McElwain, John Christee; and Hogan, Lawrence Howard, 4,103,512, Cl. 64-17.00A.

Rodzewich, Edward A.: *See*—
Anderson, James Douglas; Hayman, Edgar S., Jr.; and Rodzewich, Edward A., 4,104,303, Cl. 260-570.900.

Rohe, Lothar; Schramm, Jurgen; Klauke, Erich; Eue, Ludwig; and Schmidt, Robert Rudolf, to Bayer Aktiengesellschaft. Halogenated 4-trifluoromethyl-4'-nitro-diphenyl-ether. 4,104,313, Cl. 260-612.00R.

Rohm GmbH: *See*—
Boessler, Hanns; Elser, Wilhelm; Huebner, Klaus; and Ottofrickenstein, Hans, 4,104,227, Cl. 260-29.6HN.

Rohm, Gunter Horst. Drill chuck. 4,103,914, Cl. 279-4.000.

Rohm and Haas Company: *See*—
McNulty, Patrick J.; and Warner, Harlow L., 4,104,273, Cl. 260-294.900.

Rohner, Thomas G., to Electric Machinery Manufacturing Company. Vacuum contactor protector. 4,104,689, Cl. 361-44.000.

Rohr Industries, Incorporated: *See*—
Arnholt, Jack C.; and Main, Ronald J., 4,103,934, Cl. 280-744.000.

Rollei-Werke Franke & Heidecke: *See*—
Schneider, Arthur, 4,104,707, Cl. 362-17.000.
Scholz, Erwin; and Ehlers, Albert, 4,104,667, Cl. 354-250.000.
Strauss, Karl-Peter, 4,104,655, Cl. 354-38.000.
Strauss, Karl-Peter, 4,104,656, Cl. 354-43.000.

Romey, Ingo; Kolling, Georg; and Kokot, Hellmut, to Bergwerksverband GmbH. Process for the production of coke from pitch. 4,104,150, Cl. 208-91.000.

Romig, Charles A.: *See*—
Klosowski, Jerome M.; and Romig, Charles A., 4,104,295, Cl. 260-448.20N.

Ronan, Harold Robert, Jr.: *See*—
Baker, Robert Lee; Mahoski, Calvin Michael; Partilla, John David; and Ronan, Harold Robert, Jr., 4,104,589, Cl. 324-158.00F.

Rori, Attilio: *See*—
De Blasiis, Mario; Moccaldi, Antonio; Rori, Attilio; and Tagliati, Silvano, 4,103,553, Cl. 73-425.000.

Rose, David, to Henkel Kommanditgesellschaft Auf Aktien. Hair dye compositions containing 4,7-diaminoindazoles. 4,104,020, Cl. 8-10.200.

Rose, Frederick A.; Nord, Russell H.; and Lidicker, Roger E., to Norland Corporation. Programmed calculating input signal module for waveform measuring and analyzing instrument. 4,104,725, Cl. 364-487.000.

Rosenthal AG: *See*—
Sussmuth, Godehard, 4,104,442, Cl. 428-428.000.

Rosin, Seymour. Unit-power concentric optical systems. 4,103,989, Cl. 350-199.000.

Rosinski, Edward J.: *See*—
Rubin, Mae K.; Plank, Charles J.; and Rosinski, Edward J., 4,104,151, Cl. 208-111.000.

Rostoker, David, to Pittsburgh Corning Corporation. Pulverulent borosilicate composition and a method of making a cellular borosilicate body therefrom. 4,104,074, Cl. 106-40.00V.

Roth, Ernst: *See*—
Blank, Wilhelm; and Roth, Ernst, 4,104,551, Cl. 310-88.000.
Roth, Heinrich, to Theo Krebs AG. Flat spray nozzle head for a manually-operated spray gun. 4,103,830, Cl. 239-587.000.
Rowbotham, Philip Martin: *See*—
Hall, Nigel; Price, Raymond; and Rowbotham, Philip Martin, 4,104,270, Cl. 260-205.000.
Rowe, Blaine F., to Plastics, Inc. Device for slicing a block of cheese and the like. 4,103,579, Cl. 83-435.100.
Rowlandson, Gordon; Reeve, Douglas W.; and Rapson, W. Howard, to Erco Envirotech Ltd. Bleach plant operation. 4,104,114, Cl. 162-29.000.
Rubin, Mae K.; Plank, Charles J.; and Rosinski, Edward J., to Mobil Oil Corporation. Organic compound conversion over ZSM-23. 4,104,151, Cl. 208-111.000.
Ruble, Frank D.; Chang, Louis H.; and Fravel, John C., to Xerox Corporation. Control apparatus for serial printer. 4,103,766, Cl. 197-62.000.
Rudd, Edward H., to Magni-Power Company. Accessory locking mount. 4,103,982, Cl. 339-91.00R.
Rudy, George John: *See*—
Aichelmann, Frederick John, Jr.; Di Pilato, Nino Mario; Fehn, Thomas Peter; and Rudy, George John, 4,103,823, Cl. 235-312.000.
Ruggeri, Luigi. Saturable magnetic device for regulating commutating or converting an electric current from AC to DC or vice versa. 4,104,716, Cl. 363-102.000.
Ruiter, Antonius: *See*—
Scholtus, Christiaan Gustaaf Adolf; Lijbrink, Eduard; Meijer, Franciscus Alexander Theodorus; and Ruiter, Antonius, 4,103,816, Cl. 228-49.000.
Rupprecht, Lothar: *See*—
Rellensmann, Wolfgang; Bueb, Michael; Rupprecht, Lothar; Schmidt, Herbert; and Wagner, Wolfram, 4,103,480, Cl. 57-140.00R.
Rusbach, Maurice, to Sarmac S.A. Projectile explosive. 4,103,620, Cl. 102-38.0PP.
Russell, David B.: *See*—
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Ruter, Jorn: *See*—
Magosch, Karl-Heinz; Feinauer, Roland; and Ruter, Jorn, 4,104,261, Cl. 260-873.000.
Rykwalder, Stanley J.; and Zink, Frederick J., to Lebow Associates, Inc. Load cell. 4,103,545, Cl. 73-141.00A.
Ryvkis, Yakov Mikhailovich: *See*—
Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.
S&C Electric Company: *See*—
Zulaski, John A., 4,104,687, Cl. 361-17.000.
Sabol, Albert R.; and Petrellis, Nicholas C., to Standard Oil Company a corporation of Indiana. Metal dithiophosphates and their manufacture. 4,104,291, Cl. 260-429.900.
Sabourin, Edward T.: *See*—
Hupp, Stephen S.; Sabourin, Edward T.; Swift, Harold E.; and Vogel, Roger F., 4,104,318, Cl. 260-669.00A.
Onopchenko, Anatoli; Schulz, Johann G.; and Sabourin, Edward T., 4,104,281, Cl. 260-343.30R.
Sadwith, Howard M. Apparatus and method for washing and drying reusable containers. 4,104,080, Cl. 134-23.000.
Saint-Gobain Industries: *See*—
Pons, Andre, 4,104,076, Cl. 106-52.000.
St. Louis Diecasting Corporation: *See*—
Krieger, George H., 4,103,412, Cl. 29-460.000.
Saito, Takao: *See*—
Tanikawa, Keiichi; Obi, Tatsuro; Tanaka, Tadashi; Otsuka, Susumu; and Saito, Takao, 4,104,419, Cl. 427-46.000.
Saito, Yuji: *See*—
Kido, Shiro; Saito, Yuji; and Iwaeda, Toshinao, 4,104,208, Cl. 521-53.000.
Sakamoto, Kazuo: *See*—
Taniguchi, Tadashi; Miyaoka, Takeshi; Hagino, Daiji; Matsumoto, Ken-ichi; Sakamoto, Kazuo; Matsuda, Akira; and Shishido, Toshio, 4,103,776, Cl. 209-73.000.
Sakamoto, Yoshimasa, to New Nippon Electric Co., Ltd. Method of manufacturing an hermatically sealed electrical terminal. 4,103,416, Cl. 29-630.00D.
Sakazume, Takeshi, to Tokico Ltd. Reservoir in master cylinder of vehicle braking system. 4,103,492, Cl. 60-588.000.
Salden, Leroy, to Winden Tool & Stamping, Inc. Fender flap. 4,103,918, Cl. 280-154.50R.
Salloum, Charles R. Container handling structure. 4,103,787, Cl. 214-16.10A.
Salmon, Jean P., to Jeumont-Schneider. Continuous speed checking process for a powered vehicle and apparatus for carrying the process into effect. 4,103,851, Cl. 246-63.00C.
Saltzman, Ronald: *See*—
Wasilewski, Olgierd; Saltzman, Ronald; and Ferrara, William J., 4,104,143, Cl. 204-159.150.
Samcoe Holding Corporation: *See*—
Frezza, Robert, 4,103,402, Cl. 26-74.000.
Samuels, Michael Robert: *See*—
Angelo, Rudolph John; Blomberg, Richard Nelson; Boettcher, Fritz Peter; Ikeda, Richard Masayoshi; and Samuels, Michael Robert, 4,104,438, Cl. 428-332.000.
Samusenkov, Nikolai Vasilievich: *See*—
Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.
Sanada, Noriaki: *See*—
Uchiyama, Takashi; Sanada, Noriaki; Otaka, Teruo; Komiya, Yoshio; Okuno, Youichi; and Yokota, Hideo, 4,104,658, Cl. 354-106.000.
Sander, Bruno: *See*—
Keppler, Hans Georg; Sander, Bruno; Moeller, Rolf; Bonitz, Eckhard; and Simmler, Werner, 4,104,341, Cl. 264-9.000.
Sanders Associates, Inc.: *See*—
Brodeur, Lester R., 4,104,635, Cl. 343-103.000.
Cann, Alfred J., 4,104,594, Cl. 325-475.000.
Sandfort, Robert Melvin, to Monsanto Company. Method of fabricating magnetic bubble circuits. 4,104,422, Cl. 427-123.000.
Sandl, Dieter: *See*—
Winkler, Friedrich; Theer, Anton; Lermann, Peter; Stenzenberger, Volkmar; Griessner, Peter; Sandl, Dieter; Muller, Hermann; and Wilsch, Herbert, 4,103,993, Cl. 352-140.000.
Sandoz Ltd.: *See*—
Valenti, Salvatore, 4,104,468, Cl. 542-447.000.
Sandvik, Inc.: *See*—
Deinert, J. Clifford; Taylor, Charles E.; and Mumford, Harry W., 4,103,844, Cl. 242-107.000.
Saniga, George T.: *See*—
Didycz, William J.; Glassman, Donald; Maier, Edward E.; and Saniga, George T., 4,104,131, Cl. 203-7.000.
Sanno, Yasushi: *See*—
Sugihara, Hirosada; Watanabe, Masazumi; Motohashi, Michio; Nishikawa, Masao; and Sanno, Yasushi, 4,104,402, Cl. 424-330.000.
Santo, Philip J. Decorative waterbed frame. 4,103,375, Cl. 5-282.00R.
Sanyei Corporation: *See*—
Kishida, Shizuaki; and Takahashi, Misao, 4,104,108, Cl. 156-510.000.
Sanyo Electric Co., Ltd.: *See*—
Orii, Toshio, 4,104,593, Cl. 325-392.000.
Sara, Raymond Vincent, to Union Carbide Corporation. Method of chemically bonding aluminum to carbon substrates via monocarbides. 4,104,417, Cl. 427-37.000.
Sarantakis, Dimitrios, to American Home Products Corporation. Somatostatin analogs. 4,104,267, Cl. 260-112.50S.
Sarmac S.A.: *See*—
Rusbach, Maurice, 4,103,620, Cl. 102-38.0PP.
Sartorius-Werke GmbH (und vorm. Gottinger Prazisionswaagenfabrik GmbH): *See*—
Melcher, Franz Josef; and Oldendorf, Christian, 4,103,750, Cl. 177-1.000.
Sasaya, Hideaki: *See*—
Hibino, Yoshihiro; Sasaya, Hideaki; and Kobayashi, Akihiro, 4,104,493, Cl. 200-61.45R.
Sato, Hideaki: *See*—
Goshima, Takeshi; Sugiura, Yoshinori; Endo, Kiyonobu; Sato, Hideaki; and Kono, Kimio, 4,104,573, Cl. 318-640.000.
Sato, Isao; Gomi, Shigenori; and Furuichi, Mitsuyuki, to Hitachi, Ltd.

Overload protection apparatus for hoisting machine. 4,103,873, Cl. 254-168.000.

Sato, Koji: *See—*
Isshiki, Isao; and Sato, Koji, 4,104,616, Cl. 340-146.30Y.

Sato, Shokichi: *See—*
Minegishi, Yukihiko; Sato, Shokichi; and Yamada, Toshikazu, 4,104,609, Cl. 340-3.00C.

Sato, Yasuhito: *See—*
Yamazaki, Shuichi; Shimada, Shinichi; Sato, Yasuhito; and Shirakura, Hiroshi, 4,103,487, Cl. 60-282.000.

Sato, Yuuichi: *See—*
Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; Hashimoto, Sadakatsu; Takeda, Yoshio; Ishii, Mitsuo; and Kitanishi, Yoshitomo, 4,104,727, Cl. 364-710.000.

Satoh, Isao; and Kato, Makoto, to Matsushita Electric Industrial Co., Ltd. Holographic memory with fringe stabilizing compensation for recording medium motion. 4,104,489, Cl. 179-100.30G.

Satoh, Takashi, to Hitachi, Ltd. Address selecting circuitry for semiconductor memory device. 4,104,733, Cl. 365-189.000.

Satzinger, Gerhard: *See—*
Vigelius, Wolf-Dieter; Satzinger, Gerhard; and Herrmann, Manfred, 4,104,380, Cl. 424-244.000.

Sauer, Louis E.; and Miller, Orville C., to L.E. Sauer Machine Co. Die boards and method of producing cutting rule for same. 4,103,580, Cl. 83-663.000.

Sawa, Natsuo; and Gohda, Kyoko, to Shikoku Chemicals Corporation. Novel imidazole compounds and process for preparations thereof. 4,104,473, Cl. 548-342.000.

Sawaki, Chokei: *See—*
Hayashi, Takeshi; Shibuno, Masao; Sawaki, Chokei; and Okazaki, Susumu, 4,104,075, Cl. 106-44.000.

Sawyer, Thomas C. Method and device for repairing damaged bleeder valve apertures. 4,103,762, Cl. 188-352.000.

Saylor, Richard; Dalimonte, Alfred A.; and Nagel, Robert H., to IDR, Inc. Interleaved processor and cable head. 4,104,681, Cl. 358-141.000.

Scanley, Clyde: *See—*
Mahn, Frederick; Breindel, Kenneth; Scanley, Clyde; and Sexsmith, David, 4,104,033, Cl. 23-300.000.

Schachinger, Martin; and Kruger, Heiko, to Siemens Aktiengesellschaft. Shut-down apparatus for conveyor belts in underground mines. 4,104,518, Cl. 250-221.000.

Schachter, Joseph D. Crest and method of manufacture. 4,103,634, Cl. 112-439.000.

Schade, Gerhard, to Dynamit Nobel Aktiengesellschaft. Water-dispersible ester resin containing a moiety of polyacid or bivalent alcohol containing a sulfo group. 4,104,262, Cl. 528-295.000.

Schaefer, Daniel W., to Allis-Chalmers Corporation. Mower support for rear mounted grass catcher. 4,103,478, Cl. 56-205.000.

Schafer, Larry C.: *See—*
Weigle, Wayne L.; Fogle, Edgar L.; Cromer, Oscar M.; and Schafer, Larry C., 4,104,631, Cl. 343-7.00A.

Schafer, Stefan; Gehrmann, Klaus; Ohorodnik, Alexander; Steil, Karl-Heinz; Riechmann, Wernfried; and Bylsma, Friedhelm, to Hoechst Aktiengesellschaft. Production of methyldichlorophosphane. 4,104,304, Cl. 260-543.00P.

Schafer, Stefan: *See—*
Ohorodnik, Alexander; Gehrmann, Klaus; Schafer, Stefan; and Mainski, Albert, 4,104,299, Cl. 260-543.00P.

Schaff, Ulrich, to Siemens Aktiengesellschaft. Stepping motor control arrangement. 4,104,574, Cl. 318-696.000.

Schaffer, Howard Elias: *See—*
Bast, Bernard John; and Schaffer, Howard Elias, 4,103,473, Cl. 53-180.00M.

Schaffernicht, Klaus: *See—*
Kolbeck, Rainer; Kuckenburg, Heinz; and Schaffernicht, Klaus, 4,104,554, Cl. 313-447.000.

Schank, Richard L.: *See—*
Chu, Joseph Y.; and Schank, Richard L., 4,103,616, Cl. 101-467.000.

Schara, Robert E.: *See—*
Stringer, William G.; Schara, Robert E.; and Stocker, Charles T., 4,104,406, Cl. 426-99.000.
Stringer, William G.; Schara, Robert E.; and Stocker, Charles T., 4,104,407, Cl. 426-99.000.

Schardein, Daniel Joseph; and Lloyd, Ruth Diane, to Reynolds Metals Company. Process for applying thin molybdenum containing coatings on aluminum for solar energy absorption. 4,104,136, Cl. 204-38.00B.

Scharfe, Gerhard; and Wenzel, Rupert, to Bayer Aktiengesellschaft. Process for the preparation of 2-chlorobuta-1,3-diene. 4,104,316, Cl. 260-655.000.

Scheidel, Fritz: *See—*
Bednorz, Klaus; Johansen, Jon W.; and Scheidel, Fritz, 4,104,676, Cl. 357-79.000.

Schenck, Hans-Uwe: *See—*
Melzer, Jaroslav; and Schenck, Hans-Uwe, 4,104,226, Cl. 260-29.6WB.

Schenken, John E.: *See—*
Haas, Charles A.; and Schenken, John E., 4,103,860, Cl. 248-467.000.

Scherrer, Raymond E., to International Telephone and Telegraph Corporation. Method and apparatus for lapping or polishing materials. 4,104,099, Cl. 156-155.000.

Schilling, Rainer, to Kraftwerk Union Aktiengesellschaft. Emergency feed system for cooling nuclear reactor installations. 4,104,119, Cl. 176-38.000.

Schimmel, Karl F.: *See—*
Chang, Wen-Hsuan; Schimmel, Karl F.; and Claar, James A., 4,104,230, Cl. 260-29.6NR.

Schirmer, Henry G.: *See—*
Bieler, Anne C.; and Schirmer, Henry G., 4,104,404, Cl. 428-35.000.

Schlapp, Albert, to Rockwell-Golde G.m.b.H. Sliding roof for automobiles. 4,103,962, Cl. 296-137.00E.

Schlegel (UK) Limited: *See—*
Tipler, Donald Henry, 4,103,946, Cl. 292-114.000.

Schlig, Eugene Stewart; and Stilwell, George Raymond, Jr., to International Business Machines Corporation. Writing and erasing in AC plasma displays. 4,104,563, Cl. 315-169.0TV.

Schloemann-Siemag Aktiengesellschaft: *See—*
Benz, Willi, 4,103,576, Cl. 83-320.000.

Schlott, Richard J.: *See—*
Gay, Robert L.; Schlott, Richard J.; and Burroughs, James E., 4,104,173, Cl. 252-8.55R.

Schmid, Karlheinz, to Gebrueder Heller, Maschinenfabrik Gesellschaft mit beschraenkter Haftung. Crankshaft milling machine and milling tool for such machine. 4,103,588, Cl. 90-11.00A.

Schmid, Manfred; Sommer, Werner; and Vinnemann, Antonius. Straight knitting machine. 4,103,517, Cl. 66-75.100.

Schmidt-Dunker, Manfred; and Greb, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Compositions for preparation of aqueous solutions of low valence ^{99}technitium salts. 4,104,366, Cl. 424-1.000.

Schmidt, Helmut. Tire valve cap with pressure indicator. 4,103,549, Cl. 73-146.800.

Schmidt, Herbert: *See—*
Rellensmann, Wolfgang; Bueb, Michael; Rupprecht, Lothar; Schmidt, Herbert; and Wagner, Wolfram, 4,103,480, Cl. 57-140.00R.

Schmidt, Kenneth J., to General Trailer Company, Inc. Fifth wheel scale apparatus. 4,103,752, Cl. 177-141.000.

Schmidt, Kenneth J., to General Trailer Company, Inc. Corner mount reach clamp with hinged clamp pads. 4,103,927, Cl. 280-482.000.

Schmidt Kranz & Co.: *See—*
Hoffmann, Ernst; Reimann, Siegfried; and Aschermann, Heinz, 4,104,008, Cl. 417-397.000.

Schmidt, Robert Rudolf: *See—*
Rohe, Lothar; Schramm, Jurgen; Klauke, Erich; Eue, Ludwig; and Schmidt, Robert Rudolf, 4,104,313, Cl. 260-612.00R.

Schneider, Arthur, to Rollei-Werke Franke & Heidecke. Electronic flashlight for direct and indirect flashing. 4,104,707, Cl. 362-17.000.

Schoenfelder, James L., to Hansen, Lind, Meyer. Solar power system. 4,103,493, Cl. 60-641.000.

Schoenleber, Donald W.: *See—*
Jones, John H.; Schoenleber, Donald W.; and Grainger, Frederick, 4,103,444, Cl. 40-124.100.

Schofield, John Wardman, to National Research Development Corporation. Measurement of impurity concentration in liquids. 4,104,585, Cl. 324-58.50C.

Scholes, Gary: *See—*
Stone, Francis Gordon Albert; Green, Michael; Scholes, Gary; and Spencer, John Lionel, 4,104,471, Cl. 544-178.000.

Scholtus, Christiaan Gustaaf Adolf; Lijbrink, Eduard; Meijer, Franciscus Alexander Theodorus; and Ruiter, Antonius, to Ultra Centrifuge Nederland N.V. Method and device for welding cylindrical elements to one another. 4,103,816, Cl. 228-49.000.

Scholz, Erwin; and Ehlers, Albert, to Rollei-Werke Franke & Heidecke. Mounting means for blades of photographic shutters. 4,104,667, Cl. 354-250.000.

Scholz, Werner: *See—*
Wessel, Otto; Hofmann, Georg; Gesell, Hartmut; and Scholz, Werner, 4,104,342, Cl. 264-12.000.

Schrader, Joseph F. Viewing device for a bubble level. 4,103,430, Cl. 33-348.000.

Schramm, Jurgen: *See—*
Rohe, Lothar; Schramm, Jurgen; Klauke, Erich; Eue, Ludwig; and Schmidt, Robert Rudolf, 4,104,313, Cl. 260-612.00R.

Schreiber, Karl J., to Polaroid Corporation. Silver halide emulsions containing microvoids. 4,104,068, Cl. 96-3.000.

Schroder, Johann, to U.S. Philips Corporation. Latent heat accumulator. 4,104,185, Cl. 252-70.000.

Schroder, Rolf: *See*—
Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; and Lurssen, Klaus, 4,104,049, Cl. 71-76.000.

Schuetz, James W., to Aetna-Standard Engineering Company. Self-centering punch for billet centering machine or the like. 4,103,530, Cl. 72-312.000.

Schulte, Diethard: *See*—
Vogele, Peter; and Schulte, Diethard, 4,104,024, Cl. 21-58.000.

Schulz, Johann G.: *See*—
Onopchenko, Anatoli; Schulz, Johann G.; and Sabourin, Edward T., 4,104,281, Cl. 260-343.30R.

Schulz, Otto W.; and Pedersen, Tor Jan, to Michaelson, Randolph C. H. Hydraulic motor. 4,103,381, Cl. 15-29.000.

Schulz, Stefan, to Thyssen Industrie Aktiengesellschaft. Mixing tool. 4,104,738, Cl. 366-343.000.

Schuurmans, David M.: *See*—
Olson, Birger H.; Schuurmans, David M.; Watson, Theodore R.; Shih, Chun-nan; and Cardwell, Burton D., 4,104,369, Cl. 424-115.000.

Schwab, Heinrich: *See*—
Junkermann, Helmut; and Schwab, Heinrich, 4,104,162, Cl. 210-63.00R.

Schwabische Huttenwerke Gesellschaft mit beschrankter Haftung: *See*—
Pohl, Dieter; and Redlinger, Franz, 4,104,063, Cl. 75-243.000.

Schwender, Charles F.; and Sunday, Brooks R., to Warner-Lambert Company. Antiallergic pyrido[2,1-b]quinazolin-ones. 4,104,389, Cl. 424-251.000.

Schweppe, Manfred: *See*—
Hahn, Heinrich; Heumann, Hans; Liebing, Heinz; Schweppe, Manfred; and Hilt, Walter, 4,104,362, Cl. 423-315.000.

Schwinn Bicycle Company: *See*—
Brilando, Frank P., 4,103,922, Cl. 280-279.000.

Scibbe, Harold R.: *See*—
Martin, Thomas F.; Nagy, James A.; and Scibbe, Harold R., 4,103,842, Cl. 242-107.40A.

Scientific-Atlanta, Inc.: *See*—
Robinson, Glen P., Jr.; Shelton, Samuel V.; and Hutchins, Samuel F., 4,103,674, Cl. 126-271.000.

Sclove, David Berhard: *See*—
Gadek, Thomas Richard; Sclove, David Berhard; and Vollmer, Robert Lee, 4,104,308, Cl. 260-586.00R.

Scott, John Marshall William: *See*—
Fallis, Alexander Graham; Scott, John Marshall William; and Winter, June Gertrude, 4,104,286, Cl. 260-397.250.

Scott, William J., to Ideal Industries, Inc. Screw-on connector. 4,104,482, Cl. 174-87.000.

Scudder, Larry R.: *See*—
Evans, John C., Jr.; Brandhorst, Henry W., Jr.; Mazaris, George A.; and Scudder, Larry R., 4,104,091, Cl. 148-188.000.

SEB S.A.: *See*—
Berard, Jean Claude, 4,103,604, Cl. 99-342.000.

Sechet, Maurice Henri: *See*—
Duc, Nguyen-Cong; Brehant, Jean-Louis Marie; Pons, Benoit-Joseph; and Sechet, Maurice Henri, 4,104,123, Cl. 195-31.00P.

Sedlaczek, Richard, to Edgar Pickering (Blackburn) Limited. Method for making tufted goods. 4,103,635, Cl. 112-266.000.

Seeley, David Ronald, to Pandrol Limited. Device suitable for use in a railway rail-and-fastening assembly to insulate a rail from a rail clip and from an anchorage for the clip. 4,104,483, Cl. 174-138.00R.

Seidel, Peter-Rudolf: *See*—
Boltze, Karl-Heinz; Brendler, Otfried; and Seidel, Peter-Rudolf, 4,104,278, Cl. 260-326.13A.

Seifert, Gerd W. Thermostat for coolant presented as switch specifically for combustion engines. 4,103,824, Cl. 236-34.500.

Seifert, Josef: *See*—
Kress, Willy; and Seifert, Josef, 4,103,511, Cl. 64-4.000.

Seiko Koki Kabushiki Kaisha: *See*—
Tadashi, Nakagawa; Watanabe, Masanori; Onda, Eiichi; Koyama, Mitsuo; and Nemoto, Ichiro, 4,104,665, Cl. 354-226.000.

Seiler, Hartmut, to Robert Bosch GmbH. Integrated circuit for use with variable voltages. 4,104,546, Cl. 307-362.000.

Sekmakas, Kazys; and Hesler, Kenneth K., to DeSoto, Inc. Pigmented latex paints having superior gloss prepared by grinding a pigment into a solution of a copolymer of an unsaturated carboxylic acid. 4,104,229, Cl. 260-29.6RW.

Selous, Percy Bruce Gordon: *See*—
Jackson, John Charles; and Selous, Percy Bruce Gordon, 4,103,577, Cl. 83-337.000.

Sempliner, Arthur T.: *See*—
Burian, Paul D.; and Sempliner, Arthur T., 4,103,694, Cl. 132-73.600.

Senchur, Robert A.: *See*—
Bucchianeri, Bernard A.; and Senchur, Robert A., 4,103,552, Cl. 73-309.000.

Sensormatic Electronics Corporation: *See*—
Humble, David Raymond; and Walters, Harry Godfrey, III, 4,103,572, Cl. 81-418.000.

Sevcon Limited: *See*—
Gurwicz, David; and Sloan, Albert Everett, 4,104,571, Cl. 318-380.000.

Sexsmith, David: *See*—
Mahn, Frederick; Breindel, Kenneth; Scanley, Clyde; and Sexsmith, David, 4,104,033, Cl. 23-300.000.

Seymour, Samuel L., to PPG Industries, Inc. Supporting glass gripping tongs during glass sheet processing. 4,104,047, Cl. 65-273.000.

Shacter, John: *See*—
Garrett, George A.; and Shacter, John, 4,104,037, Cl. 55-16.000.

Shah, Naren Chimanlal, to Harris Corporation. Analog correction system. 4,104,566, Cl. 315-371.000.

Shanbhag, Sudhakar P.; Liggett, Louis G.; and Mikovits, Adrienne C., to General Foods Corporation. Process for preparing bacon analog. 4,104,415, Cl. 426-656.000.

Shanley, Bernard J. Tilting traction apparatus. 4,103,681, Cl. 128-71.000.

Shansky, Albert: *See*—
Lapidus, Herbert; and Shansky, Albert, 4,104,021, Cl. 8-10.200.

Sharp Kabushiki Kaisha: *See*—
Kasubuchi, Takeshi, 4,104,728, Cl. 364-712.000.
Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; Hashimoto, Sadakatsu; Takeda, Yoshio; Ishii, Mitsuo; and Kitanishi, Yoshitomo, 4,104,727, Cl. 364-710.000.

Sharpe, Max H.: *See*—
Roberts, Marion L.; Sharpe, Max H.; and Krupnick, Albert C., 4,104,134, Cl. 204-37.00R.

Shaver, J. Lyle, to Allis-Chalmers Corporation. Combine with means for reducing the bounce of accelerated grain. 4,103,691, Cl. 130-24.000.

Shaw, Robert, to B & K Industries Ltd. Bale mover. 4,103,794, Cl. 214-518.000.

Shaw, William D. Method for producing tubular article. 4,104,095, Cl. 156-83.000.

Sheldon, Edward Emanuel. Apparatus with two vacuum chambers for electrophotography producing image by electrical charges. 4,104,647, Cl. 346-158.000.

Shell Oil Company: *See*—
Caruso, Gerard P., 4,104,177, Cl. 252-51.50A.
Chipman, Arthur H. Tigner, 4,103,536, Cl. 73-40.000.
Hansen, David R., 4,104,323, Cl. 260-829.000.
Kalden, Adrianus B., 4,104,611, Cl. 340-15.50F.
Orrell, Leonard; and Whittle, John, 4,103,700, Cl. 137-172.000.

Shelton, John J.: *See*—
Brown, Jerald L.; and Shelton, John J., 4,103,859, Cl. 248-425.000.

Shelton, Samuel V.: *See*—
Robinson, Glen P., Jr.; Shelton, Samuel V.; and Hutchins, Samuel F., 4,103,674, Cl. 126-271.000.

Shen, Kwan Ting: *See*—
Nelson, Robert C.; Gannon, John Allister; and Shen, Kwan Ting, 4,104,224, Cl. 260-29.40R.

Shepherd Machinery Company: *See*—
Shepherd, Willard W., 4,103,883, Cl. 269-71.000.

Shepherd, Willard W., to Shepherd Machinery Company. Adjustable supporting structure. 4,103,883, Cl. 269-71.000.

Shepley, Paul E., Jr. Bow string mounting and tensioning brackets. 4,103,667, Cl. 124-24.00R.

Sheppard, Walter R., Jr. Adjustable trailer hitch with interchangeable connecting means. 4,103,928, Cl. 280-490.00R.

Sherer, Paul; and Hester, Gerald Paul, to MSI Data Corporation. Bar code reader and decoder. 4,104,514, Cl. 235-466.000.

Sherman, Michael I.; and Prough, James R., to Kamyr, Inc. Two-stage digestion with between vessel heating. 4,104,113, Cl. 162-19.000.

Shibuno, Masao: *See*—
Hayashi, Takeshi; Shibuno, Masao; Sawaki, Chokei; and Okazaki, Susumu, 4,104,075, Cl. 106-44.000.

Shibuya, Tsunenori, to Diesel Kiki Co. Ltd. Rotary compressor comprising improved rotor lubrication system. 4,104,010, Cl. 418-76.000.

Shigemori, Daizo: *See*—
Toda, Toshiharu; and Shigemori, Daizo, 4,104,693, Cl. 361-120.000.

Shih, Chun-nan: *See*—
Olson, Birger H.; Schuurmans, David M.; Watson, Theodore R.; Shih, Chun-nan; and Cardwell, Burton D., 4,104,369, Cl. 424-115.000.

Shijima, Shoji: *See*—
Fujimaki, Taketoshi; Shijima, Shoji; and Harada, Shunichi, 4,104,135, Cl. 204-37.00T.
Shikoku Chemicals Corporation: *See*—
Sawa, Natsuo; and Gohda, Kyoko, 4,104,473, Cl. 548-342.000.
Shimada, Shinichi: *See*—
Yamazaki, Shuichi; Shimada, Shinichi; Sato, Yasuhito; and Shirakura, Hiroshi, 4,103,487, Cl. 60-282.000.
Shimizu, Shigehisa: *See*—
Utsui, Masaaki; Tsuruta, Hikaru; Mizutani, Shigemitsu; and Shimizu, Shigehisa, 4,103,575, Cl. 83-298.000.
Shimoji, Masaharu; Tatsutomi, Yasuo; Hirose, Yutaka; Yamasaki, Atsumichi; and Kikura, Katsuaki, to Toyo Kogyo Co., Ltd. Fuel supply means for rotary piston engines. 4,103,666, Cl. 123-219.000.
Shimoyama, Kunio: *See*—
Maitani, Yoshihisa; Shimoyama, Kunio; Yoshida, Muneaki; Hashimoto, Akihiko; and Kitagawa, Masahiro, 4,104,654, Cl. 354-31.000.
Shimozono, Akira: *See*—
Kobayashi, Osamu; Nakamura, Ikuo; and Shimozono, Akira, 4,103,908, Cl. 277-96.200.
Shimp, Alan B.; Meyer, Thomas N.; and Elms, Robert T., to Westinghouse Electric Corp. Circuit breaker apparatus including asymmetrical fault detector. 4,104,691, Cl. 361-96.000.
Shin, Kju Hi: *See*—
Wollensak, John C.; Shin, Kju Hi; Ihrman, Kryn G.; and Elsey, Paul G., 4,104,255, Cl. 260-45.95C.
Shinagawa Refractories Co., Ltd.: *See*—
Hayashi, Takeshi; Shibuno, Masao; Sawaki, Chokei; and Okazaki, Susumu, 4,104,075, Cl. 106-44.000.
Shingyouchi, Fusao. Capsule. 4,103,774, Cl. 206-45.200.
Shinmura, Noboru: *See*—
Tokuno, Masateru; Tanigawa, Hisahiro; Kaneko, Masayoshi; and Shinmura, Noboru, 4,104,723, Cl. 364-475.000.
Shinoda, Kenzo: *See*—
Manabe, Katsuhide; Masumi, Jiro; Tochitani, Tomotada; and Shinoda, Kenzo, 4,104,432, Cl. 428-216.000.
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Shishido, Toshio: *See*—
Taniguchi, Tadashi; Miyaoka, Takeshi; Hagino, Daiji; Matsumoto, Ken-ichi; Sakamoto, Kazuo; Matsuda, Akira; and Shishido, Toshio, 4,103,776, Cl. 209-73.000.
Shmidt, Rudolf Genrikhovich: *See*—
Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and Deeva, Alexandra Ivanovna, administratrix, 4,103,745, Cl. 173-57.000.
Shnapir, Yakov Isaakovich: *See*—
Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and Deeva, Alexandra Ivanovna, administratrix, 4,103,745, Cl. 173-57.000.
Shoofler, Renald. Barbell with collapsible load carrying chambers. 4,103,887, Cl. 272-123.000.
Showa Denko K.K.: *See*—
Ueshima, Takashi; Tanaka, Yasuzi; Yokoyama, Toshiro; and Kobayashi, Shoichi, 4,104,325, Cl. 260-876.00R.
Sibler, Guenter W.: *See*—
Huertgen, Helmut B.; Larson, Walter F.; and Sibler, Guenter W., 4,103,529, Cl. 72-253.00A.
Sibley, Murray J.; Yung, Gordon H. K.; and Urrea, Petronio D., to Barnes-Hind Pharmaceuticals, Inc. Composition and method treating soft contact lenses at elevated temperatures. 4,104,187, Cl. 252-106.000.
Sichert, Richard. Therapeutical composition. 4,104,373, Cl. 424-195.000.
Siegler, Manfred: *See*—
Reuther, Wolfgang; Oppenlaender, Knut; Raff, Paul; Pommer, Ernst-Heinrich; and Siegler, Manfred, 4,104,374, Cl. 424-185.000.
Siemens Aktiengesellschaft: *See*—
Aichinger, Horst; Kranberg, Heinz-Erik; and Koehler, Karlheinz, 4,104,524, Cl. 250-402.000.
Bednorz, Klaus; Johansen, Jon W.; and Scheidel, Fritz, 4,104,676, Cl. 357-79.000.
Franke, Kurt, 4,104,525, Cl. 250-402.000.
Giebel, Wolfgang; and Krause, Herbert, 4,103,911, Cl. 277-210.000.
Glockner, Erhard; and Wittstadt, Anton, 4,103,763, Cl. 192-2.000.
Hagendorn, Heinrich, 4,103,864, Cl. 251-63.600.
Hofmann, Ruediger; and Von Basse, Paul-Werner, 4,104,735, Cl. 365-230.000.
Kersten, Ralf, 4,103,987, Cl. 350-96.210.
Schachinger, Martin; and Kruger, Heiko, 4,104,518, Cl. 250-221.000.
Schaff, Ulrich, 4,104,574, Cl. 318-696.000.
Silva, Patricia A. Wall-mounted directory. 4,103,980, Cl. 312-185.000.
Silverberg, Morton, to Xerox Corporation. Imaging apparatus. 4,103,995, Cl. 355-14.000.
Silverstein, Sidney, to Pearl-Wick Corporation. Container. 4,103,805, Cl. 220-331.000.
Silvey, Elmer R. Piston-cylinder seal assembly. 4,103,910, Cl. 277-165.000.
Silvey, Robert L. Toy chest. 4,103,455, Cl. 46-99.000.
Simich, Irene C. Load regulator. 4,103,881, Cl. 267-177.000.
Simmler, Werner: *See*—
Keppler, Hans Georg; Sander, Bruno; Moeller, Rolf; Bonitz, Eckhard; and Simmler, Werner, 4,104,341, Cl. 264-9.000.
Simonides, Charlotte, executrix: *See*—
Funke, Wilhelm; Honke, Heinrich; and Simonides, Heinz, deceased, 4,103,975, Cl. 299-43.000.
Simonides, Heinz, deceased: *See*—
Funke, Wilhelm; Honke, Heinrich; and Simonides, Heinz, deceased, 4,103,975, Cl. 299-43.000.
Simons, Daniel R.: *See*—
Andrews, Richard E.; Hooker, Ira D.; and Simons, Daniel R., 4,103,789, Cl. 214-41.00R.
Simroth, Donald W., to Union Carbide Corporation. Liquid polymer/-polyols and polyurethane elastomers based thereon. 4,104,236, Cl. 260-33.20R.
Sims, Victor A., to Air Products & Chemicals, Inc. Alkenyl 1-(2-Aminoethyl) alkyleneureido succinamates, their synthesis, and use in aqueous emulsion polymer systems. 4,104,220, Cl. 260-29.60R.
Singer, Abraham; and Minkowski, Jan M., to United States of America, Army. Bandwidth substitution method and system for absolute measurement of power at all radio frequencies. 4,104,587, Cl. 324-95.000.
Singer Company, The: *See*—
Bowles, Theodore L., 4,103,632, Cl. 112-158.00E.
Frank, Carl S.; Grzybowski, John J.; and Peets, Robert S., 4,103,633, Cl. 112-217.100.
Greenwood, Ivan Anderson, 4,104,577, Cl. 324-0.50F.
Sir James Farmer Norton & Co., Limited: *See*—
Cruz, Edmundo Novas; and Valadares, Alvaro Neff, 4,103,615, Cl. 101-120.000.
Sirtl, Wolfgang: *See*—
Vitzthum, Otto; Hubert, Peter; and Sirtl, Wolfgang, 4,104,409, Cl. 426-386.000.
SKF Industrial Trading and Development Company N.V.: *See*—
Franco, Colanzi; and Guido, Sapello, 4,103,567, Cl. 74-710.000.
Sleeth, Robert S.: *See*—
Frederiksen, Thomas M.; Sleeth, Robert S.; and Howard, William M., 4,104,547, Cl. 307-362.000.
Sleziona, Joseph; and Demarcq, Michel, to Produits Chimiques Ugine Kuhlmann. Phosphine oxides having polyfluorinated-chain and their preparation. 4,104,309, Cl. 260-606.50P.
Sloan, Albert Everett: *See*—
Gurwicz, David; and Sloan, Albert Everett, 4,104,571, Cl. 318-380.000.
Sloop, Conrad Beebe. Frame for holding a camera. 4,104,623, Cl. 354-293.000.
Smart, Albert G.: *See*—
Mayer, James W.; and Smart, Albert G., 4,103,377, Cl. 5-343.000.
Smith, David A.; and Hertrick, Thomas P. Roll-up sign. 4,103,445, Cl. 40-125.00G.
Smith, David G., to GSW Limited - GSW Limitee. Window oven door for self-cleaning oven. 4,103,671, Cl. 126-200.000.
Smith Engineering Company: *See*—
Aydelott, Max M.; Hartman, Richard L.; and York, James A., 4,103,738, Cl. 165-178.000.
Smith, Geoffrey Allan, to Dawson International Limited. Fixation of dyes and other chemicals in textile fibres. 4,104,019, Cl. 8-2.000.
Smith, Herman W., to Upjohn Company, The. 5-Oxa-13,14-didehydro-11-deoxy-17-phenyl-18,19,20-trinor-$PGF_{1\alpha}$ compounds. 4,104,474, Cl. 560-53.000.
Smith Kline & French Laboratories Limited: *See*—
Black, James Whyte; and Parsons, Michael Edward, 4,104,382, Cl. 424-247.000.
Bloch, Maurice, 4,104,370, Cl. 424-153.000.
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,104,381, Cl. 424-246.000.

Smith, Marvin L., to Dixilyn International, Inc. Drilling substructure transfer system. 4,103,503, Cl. 61-97.000.
Smith, Norman Alfred; and Kitzing, Rainer, to Ciba-Geigy AG. Vinylsulphone hardeners. 4,104,302, Cl. 260-561.00S.
Smith, Ray E.; and Albright, James A., to Velsicol Chemical Corporation. Durable flame retardant finishes for textile materials. 4,104,172, Cl. 252-8.100.
Smith, Richard Hanley; and Laws, Peter Graham, to Plessey Handel und Investments AG. Converter arrangements. 4,104,714, Cl. 363-21.000.
Smith, Roger R. Vehicle anti-roll mechanism. 4,103,920, Cl. 280-112.00A.
Smith & Wesson Chemical Company, Inc.: *See*—
Litman, Alan, 4,104,614, Cl. 340-81.00R.
Smither, Miles A., to Geosource Inc. Instantaneous floating point amplifier. 4,104,596, Cl. 330-9.000.
SmithKline Corporation: *See*—
Gallagher, Gregory, Jr.; Pfeiffer, Francis R.; and Weinstock, Joseph, 4,104,379, Cl. 424-244.000.
Labaw, Clifford Steven; Webb, Robert Lee; and Wellman, George Robert, 4,104,472, Cl. 548-337.000.
Smiths Industries Limited: *See*—
Barrett, Edward George, 4,103,515, Cl. 64-26.000.
Smolderen, Albert Emiel, to AGFA-GEVAERT N.V. Four-cornered flat wrapping. 4,103,775, Cl. 206-455.000.
Snavely, Kenneth E., to Phillips Petroleum Company. Rubber compositions containing polysiloxane elastomers and butadiene-styrene copolymers. 4,104,322, Cl. 260-827.000.
Snavely, Kenneth E., to Phillips Petroleum Company. Rubber composition. 4,104,334, Cl. 260-888.000.
Snezhnoi, Rostislav Lukyanovich: *See*—
Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.
Sobecks, Ronald S.: *See*—
Tisone, Thomas C.; Krueger, Helmut H. A.; Sobecks, Ronald S.; and Tauber, Richard N., 4,104,507, Cl. 219-513.000.
Societe Anonyme dite Societe Nationale Industrielle Aerospatiale: *See*—
Mouille, Rene Louis, 4,104,003, Cl. 416-141.000.
Societe Anonyme Francaise du Ferodo: *See*—
Filderman, Rene Gabriel, 4,103,761, Cl. 188-73.500.
Societe Generale de Mecanique et de Metallurgie: *See*—
Chanton, Edmond, 4,104,009, Cl. 418-48.000.
Societe Nationale Elf Aquitaine (Production): *See*—
Blu, Gilbert; and Lazarre, Flavien, 4,103,707, Cl. 137-604.000.
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,103,500, Cl. 61-69.00R.
Societe Suisse pour l'Industrie Horlogere (SSIH) Management Services S.A.: *See*—
Engdahl, Jean; and Matthey, Huber, 4,104,553, Cl. 310-352.000.
Solbern Corp.: *See*—
Eisenberg, Bernard C., 4,103,720, Cl. 141-1.000.
Soldatov, Viktor Alexeevich: *See*—
Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and Deeva, Alexandra Ivanovna, administratrix, 4,103,745, Cl. 173-57.000.
Soloviev, Petr Petrovich: *See*—
Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.
Sommer, Werner: *See*—
Schmid, Manfred; Sommer, Werner; and Vinnemann, Antonius, 4,103,517, Cl. 66-75.100.
Sonoco Products Company: *See*—
Peters, Anthony J., 4,103,837, Cl. 242-46.210.
Sotec, Inc.: *See*—
Kiely, William L.; and Pedersen, Kristen I., 4,103,942, Cl. 285-276.000.
Sousa, Anthony A.: *See*—
Durden, John A., Jr.; Sousa, Anthony A.; and Stephen, John F., 4,104,043, Cl. 71-107.000.
Soussan, Salomon: *See*—
Debord, Daniel; and Soussan, Salomon, 4,104,457, Cl. 526-203.000.
Southgate, John Peter: *See*—
Hill, William Frank; and Southgate, John Peter, 4,104,534, Cl. 290-37.00A.
Souza, Anthony J., to Woodstream Corporation. Repeating animal trap with side extension. 4,103,448, Cl. 43-67.000.
Spacek, Pavel: *See*—
Vozka, Stanislav; Spacek, Pavel; and Kubin, Miroslav, 4,104,363, Cl. 423-338.000.
Spatig, Thomas G., to Chesapeake and Ohio Railway Company, The; and Baltimore and Ohio Railroad Company, The. Railway hopper car door frame assembly. 4,103,817, Cl. 228-173.00C.
Speed, Eugene: *See*—
Brooks, Bertram; and Speed, Eugene, 4,103,921, Cl. 280-267.000.
Spencer, John Lionel: *See*—
Stone, Francis Gordon Albert; Green, Michael; Scholes, Gary; and Spencer, John Lionel, 4,104,471, Cl. 544-178.000.
Sperry Rand Corporation: *See*—
Isbister, Eric J.; and Fidler, Horace E., 4,104,629, Cl. 343-6.00R.
Spevack, Jerome S., to Deuterium Corporation. Dual temperature exchange systems. 4,104,032, Cl. 23-270.50W.
Spitz, Erich: *See*—
Desormiere, Bernard; and Spitz, Erich, 4,103,988, Cl. 350-162.00R.
Spohr, Horst, to Bautex Adolf Stover KG. Slatted blinds. 4,103,727, Cl. 160-168.00R.
Sporlan Valve Company: *See*—
Lange, Harold T., 4,104,044, Cl. 62-324.000.
Sprague Electric Company: *See*—
Maher, John P.; and Johnson, Theodore W., 4,104,421, Cl. 427-96.000.
Sprague, Peter W.; and Heikes, James E., to E. R. Squibb & Sons, Inc. 1,3-Benzodithiolanes. 4,104,467, Cl. 542-442.000.
Square D Company: *See*—
Dix, James Allen; Guettel, Marvin A.; and Aslin, Michael, 4,104,724, Cl. 364-477.000.
Srinivasan, Vadake R.; and Choi, Ye-Chin, to Louisiana State University Foundation. Process for the production of single cell protein and amino acids. 4,104,124, Cl. 195-33.000.
Stahl-Urban Company: *See*—
Conner, William R., Jr., 4,103,363, Cl. 2-227.000.
Stahlecker, Fritz; and Stahlecker, Hans. Tangential belt drive mechanism for spinning rotors. 4,103,479, Cl. 57-105.000.
Stahlecker, Hans: *See*—
Stahlecker, Fritz; and Stahlecker, Hans, 4,103,479, Cl. 57-105.000.
Stama Stark Maschinenfabrik Gotthilf Stark: *See*—
Blum, Gunther; and Stark, Gerhard, 4,103,405, Cl. 29-26.00A.
Stanadyne, Inc.: *See*—
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Standard Brands Incorporated: *See*—
Antrim, Richard Lee; and Harris, Donald Wayne, 4,104,463, Cl. 536-56.000.
Standard Oil Company: *See*—
Meguerian, Garbis H.; and Rakowsky, Frederick W., 4,104,360, Cl. 423-213.200.
Standard Oil Company a corporation of Indiana: *See*—
Grutsch, James F., 4,104,163, Cl. 210-80.000.
Hoff, Glen R., 4,104,199, Cl. 252-430.000.
Sabol, Albert R.; and Petrellis, Nicholas C., 4,104,291, Cl. 260-429.900.
Stanley-Mabo S.A.: *See*—
Quenot, Michel, 4,103,421, Cl. 30-162.000.
Stanley Works Pty. Ltd., The: *See*—
Matthews, Bruce Ernest; and Day, Ronald, 4,103,419, Cl. 30-95.000.
Stark, Gerhard: *See*—
Blum, Gunther; and Stark, Gerhard, 4,103,405, Cl. 29-26.00A.
State of Michigan: *See*—
Olson, Birger H.; Schuurmans, David M.; Watson, Theodore R.; Shih, Chun-nan; and Cardwell, Burton D., 4,104,369, Cl. 424-115.000.
Stauffer Chemical Company: *See*—
Fancher, Llewellyn W., 4,104,375, Cl. 424-200.000.

Staunton, John J. J., to Perkin-Elmer Corporation, The. Aerosol-reducing slide holder system. 4,103,643, Cl. 118-50.000.

Stech, Don W., to Raymond Lee Organization, Inc., The, a part interest. Electroplating tank having electric rinse water heating system. 4,104,148, Cl. 204-242.000.

Stechmeyer, Frank W., to Union Oil Company of California. Method for transporting waxy oils by pipeline. 4,104,171, Cl. 252-8.300.

Stefano, Patrick L., to Miska, Stanley M., Sr. Game devices. 4,103,891, Cl. 273-97.00R.

Steigerwald, Conrad John, to Honeywell Information Systems Inc. Apparatus for cutting and forming flexible beam leads of an integrated circuit chip. 4,103,718, Cl. 140-105.000.

Steil, Karl-Heinz: *See*—
Schafer, Stefan; Gehrmann, Klaus; Ohorodnik, Alexander; Steil, Karl-Heinz; Riechmann, Wernfried; and Bylsma, Friedhelm, 4,104,304, Cl. 260-543.00P.

Steinborn, Wilhelm; and Mechenbier, Alois, to Diehl; and Tip-Top-Saar Gesellschaft fur industrielle Vulkanisierung m.b.H. Plugs for bores in rocks or the like. 4,103,498, Cl. 61-45.00B.

Steinbrecher, Lester; and Hall, Wilbur S., to Amchem Products, Inc. Process for coating metals. 4,104,424, Cl. 427-435.000.

Steiner, Henry William. Barrel carrier. 4,103,812, Cl. 224-45.00P.

Steiner, Peter; and Bischoff, William Frederick, to Foster Wheeler Energy Corporation. Water seal for regenerator. 4,103,902, Cl. 277-12.000.

Stemmle, Joseph A.: *See*—
Breger, Joseph L.; and Stemmle, Joseph A., 4,103,992, Cl. 351-160.000.

Stenzenberger, Volkmar: *See*—
Winkler, Friedrich; Theer, Anton; Lermann, Peter; Stenzenberger, Volkmar; Griessner, Peter; Sandl, Dieter; Muller, Hermann; and Wilsch, Herbert, 4,103,993, Cl. 352-140.000.

Stephan, Rudolf: *See*—
Swoboda, Johann; Stephan, Rudolf; and Heinz, Gerhard, 4,104,328, Cl. 260-876.00R.

Stephen, John F.: *See*—
Durden, John A., Jr.; Sousa, Anthony A.; and Stephen, John F., 4,104,043, Cl. 71-107.000.

Sterling Drug Inc.: *See*—
Lesher, George Y.; and Opalka, Chester J., Jr., 4,104,385, Cl. 424-250.000.

Sterling, John R., to John Sterling Corporation. Portable adjustable clothes drying device. 4,103,781, Cl. 211-86.000.

Stevens, Catherine V.: *See*—
Latta, Bruce M.; Stevens, Catherine V.; and Dennis, Bruce E., 4,104,443, Cl. 428-474.000.

Stilwell, George Raymond, Jr.: *See*—
Schlig, Eugene Stewart; and Stilwell, George Raymond, Jr., 4,104,563, Cl. 315-169.0TV.

Stocker, Charles T.: *See*—
Stringer, William G.; Schara, Robert E.; and Stocker, Charles T., 4,104,406, Cl. 426-99.000.
Stringer, William G.; Schara, Robert E.; and Stocker, Charles T., 4,104,407, Cl. 426-99.000.

Stoferle, Theodor; and Theimert, Paul Heinz. Surface hardness testing apparatus. 4,103,538, Cl. 73-81.000.

Stoffel, Robert W.; and Berntsen, Robert A. Day-night mirror control apparatus. 4,103,560, Cl. 74-501.00M.

Stoll, Kurt. Disconnectable coupling for conduits of deformable material. 4,103,941, Cl. 285-238.000.

Stommel, Manfred: *See*—
Bohnstedt, Werner; and Stommel, Manfred, 4,104,449, Cl. 429-110.000.

Stone Conveyor, Inc. (Entire): *See*—
Jorgensen, Morell L., 4,103,769, Cl. 198-781.000.

Stone, Francis Gordon Albert; Green, Michael; Scholes, Gary; and Spencer, John Lionel, to Air Products & Chemicals, Inc. Method of adding amines to 1,3 dienes. 4,104,471, Cl. 544-178.000.

Stone, Myron. Folding assembled article such as a toy airplane. 4,103,454, Cl. 46-79.000.

Storey Brothers and Company Limited: *See*—
Fenton, Sidney Desmond, 4,104,430, Cl. 428-175.000.

Straub, Roger E.: *See*—
Mathison, Frederic N.; and Straub, Roger E., 4,103,820, Cl. 229-37.00R.

Strauss, Carl R.: *See*—
Roberts, Michael G.; Strauss, Carl R.; and Bolen, Charles E., 4,104,241, Cl. 260-40.00R.

Strauss, Karl-Peter, to Rollei-Werke Franke & Heidecke. Camera with automatic exposure control system. 4,104,655, Cl. 354-38.000.

Strauss, Karl-Peter, to Rollei-Werke Franke & Heidecke. Control means for a diaphragm of a single lens reflex camera. 4,104,656, Cl. 354-43.000.

Strax, Norman, to Charles & Stella Guttman Breast Diagnostic Institute. Automated mammography apparatus for mass screening. 4,104,528, Cl. 250-451.000.

Strayer, Larry G., to Hawaiian Trust Company Ltd. Computer control of moving objects such as aircraft moving from one sector to another. 4,104,512, Cl. 364-439.000.

Strike Corporation, The: *See*—
Payet, George Louis, 4,104,022, Cl. 8-115.600.

Stringer, William G.; Schara, Robert E.; and Stocker, Charles T., to General Foods Corporation. Coated expanded animal food. 4,104,406, Cl. 426-99.000.

Stringer, William G.; Schara, Robert E.; and Stocker, Charles T., to General Foods Corporation. Expanded animal food coated with dextrin and fat. 4,104,407, Cl. 426-99.000.

Stroucken, Klaus H. D., to Alfa-Laval AB. Centrifugal separator. 4,103,822, Cl. 233-20.00A.

Struger, Odo J.: *See*—
Grudowski, Raymond A.; and Struger, Odo J., 4,104,731, Cl. 364-900.000.

Strussion, Thomas; and Moore, Harry D. Map display device. 4,103,436, Cl. 35-40.000.

Studiengesellschaft Kohle mbH: *See*—
Eisenbach, Wilhelm; Lehmkuhl, Herbert; and Wilke, Gunther, 4,104,140, Cl. 204-78.000.
Vitzthum, Otto; Hubert, Peter; and Sirtl, Wolfgang, 4,104,409, Cl. 426-386.000.

Stutz, Robert C., to Niagara Blower Company. Method and apparatus for concentrating aqueous solutions. 4,104,112, Cl. 159-4.00R.

Sudduth, Jerome R.; and Keyworth, Donald A., to Tenneco Chemicals, Inc. Process for the purification of gas streams. 4,104,146, Cl. 204-165.000.

Sudo, Katsumi; and Kanazawa, Yukio, to Rank Xerox, Ltd. Device for detecting abnormal temperature in fixer. 4,104,692, Cl. 361-106.000.

Sugahara, Kouichi: *See*—
Iida, Kiyonobu; Tani, Yoshio; and Sugahara, Kouichi, 4,103,664, Cl. 123-191.00L.

Sugihara, Hirosada; Watanabe, Masazumi; Motohashi, Michio; Nishikawa, Masao; and Sanno, Yasushi, to Takeda Chemical Industries, Ltd. 5,6-Dihydroxy aminotetralol compounds. 4,104,402, Cl. 424-330.000.

Sugimori, Shiro; and Toyoda, Kenji, to Nippon Kogaku K.K. Safety device for automatic exposure control camera having motor drive equipment. 4,104,661, Cl. 354-173.000.

Sugiura, Yoshinori: *See*—
Goshima, Takeshi; Sugiura, Yoshinori; Endo, Kiyonobu; Sato, Hideaki; and Kono, Kimio, 4,104,573, Cl. 318-640.000.

Suhm, Richard R. Vehicle safety device. 4,103,924, Cl. 280-289.00R.

Suilene Argentina S.A.: *See*—
Ballesteros, Juan Carlos Corral, 4,104,435, Cl. 428-288.000.

Sullivan, Ann Clare: *See*—
Gallo-Torres, Hugo; Guthrie, Robert William; Hamilton, James Guthrie; Kierstead, Richard Wightman; and Sullivan, Ann Clare, 4,104,285, Cl. 260-397.100.

Sullivan, Paul E.: *See*—
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Sultan, Sven Gilbert: *See*—
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Sumitomo Chemical Company, Limited: *See*—
Oi, Naobumi; Moriguchi, Koichi; and Matsuda, Mari, 4,104,040, Cl. 55-67.000.

Sumitomo Durez Company, Ltd.: *See*—
Murata, Takao; Nakamura, Nobutaka; and Goto, Tateo, 4,104,698, Cl. 361-321.000.

Sumitomo Electric Industries, Ltd.: *See*—
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Okita, Koichi, 4,104,394, Cl. 264-89.000.

Sun Chemical Corporation: *See*—
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Sun Oil Company of Pennsylvania: *See*—
Wagner, Walter D.; and Gayle, Harold R., 4,103,705, Cl. 137-544.000.

Sun Ventures, Inc.: *See*—
Angstadt, Howard P., 4,104,310, Cl. 260-610.00B.
Angstadt, Howard P., 4,104,311, Cl. 260-610.00B.
Angstadt, Howard P.; and Griffin, William P., Jr., 4,104,312, Cl. 260-610.00B.

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Suntech, Inc.: *See*—
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Norton, Richard S., 4,104,279, Cl. 260-326.00N.

Super Products Corporation: *See—*
Flynn, Thomas P.; and Wurster, James C., 4,103,841, Cl. 242-86.200.
Surko, Walter E., Jr., to Emhart Industries, Inc. Pin tumbler lock. 4,103,526, Cl. 70-364.00A.
Sussmuth, Godehard, to Rosenthal AG. Silicon nitride-containing material with self-glazing surface and process for its production. 4,104,442, Cl. 428-428.000.
Sutcliffe, Grenville G.; Washausen, Roy F.; Tomes, William L.; and Gould, Herman Ray, to Husky Corporation. Nozzle spout coupling. 4,103,936, Cl. 285-26.000.
Sutton Engineering Company: *See—*
Huertgen, Helmut B.; Larson, Walter F.; and Sibler, Guenter W., 4,103,529, Cl. 72-253.00A.
Sutton, William H. Apparatus for discharging from a silo. 4,103,788, Cl. 214-17.0DA.
Suzuki, Osamu; Ueda, Masaki; and Ishii, Akira, to Fuji Photo Film Co., Ltd. Magnetic head cleaning article. 4,104,436, Cl. 428-297.000.
Svoboda, Josef: *See—*
Krob, Erwin; Weigl, Erwin; and Svoboda, Josef, 4,103,916, Cl. 280-605.000.
Swann, David Allen. Electric switches. 4,104,494, Cl. 200-67.00G.
Swanson, Billy L., to Phillips Petroleum Company. Method for acidizing subterranean formations. 4,103,742, Cl. 166-282.000.
Sweany, Louis P.; and Burk, Michael T., to P.R. Mallory & Co. Inc. High output audible alarm device utilizing a piezoelectric transducer and voltage doubling means. 4,104,628, Cl. 340-384.00E.
Sweet, Anthony W.: *See—*
Weir, Donald A.; and Sweet, Anthony W., 4,104,488, Cl. 179-18.0FA.
Swenson, Gordon. Remote threading flagpole. 4,103,642, Cl. 116-174.000.
Swenson, Richard F., to Milsco Manufacturing Company. Seat support assembly for a recreational vehicle. 4,103,858, Cl. 248-399.000.
Swift, Harold E.: *See—*
Hupp, Stephen S.; Sabourin, Edward T.; Swift, Harold E.; and Vogel, Roger F., 4,104,318, Cl. 260-669.00A.
Swoboda, Johann; Stephan, Rudolf; and Heinz, Gerhard, to BASF Aktiengesellschaft. Impact resistant thermoplastic molding compositions. 4,104,328, Cl. 260-876.00R.
Sybron Corporation: *See—*
Mikes, John A.; Greer, Albert H.; and Norwood, Amos, 4,104,209, Cl. 521-62.000.
Sykes Construction Services Limited: *See—*
Cashman, Patrick Michael, 4,103,502, Cl. 61-86.000.
Syntex (U.S.A.) Inc.: *See—*
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Systron-Donner Corporation: *See—*
Hanson, Richard A., 4,104,572, Cl. 318-631.000.
Szkrybalo, William, to Hoffmann-La Roche Inc. Plant growth regulants. 4,104,052, Cl. 71-88.000.
Tabushe, Satoshi: *See—*
Nishida, Tsuyoshi; Tabushe, Satoshi; and Akeda, Kouichi, 4,103,650, Cl. 123-41.860.
Tachibana, Yoshishige, to Toyo Boseki Kabushiki Kaisha. Apparatus for successively processing continuous textile fabric. 4,103,521, Cl. 68-22.00R.
Tadashi, Nakagawa; Watanabe, Masanori; Onda, Eiichi; Koyama, Mitsuo; and Nemoto, Ichiro, to Seiko Koki Kabushiki Kaisha. Contact mechanism of shutter for camera. 4,104,665, Cl. 354-226.000.
Tagawa, Masatoshi, to Trio Kabushiki Kaisha. Crystal oscillating circuit. 4,104,599, Cl. 331-116.00R.
Tagliati, Silvano: *See—*
De Blasiis, Mario; Moccaldi, Antonio; Rori, Attilio; and Tagliati, Silvano, 4,103,553, Cl. 73-425.000.
Tago, Kazuo: *See—*
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Takabayashi, Yojiro, to Nippon Gakki Seizo Kabushiki Kaisha. Electric guitar. 4,103,583, Cl. 84-291.000.
Takada, Michio: *See—*
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Takaha, Noboru: *See—*
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Takahashi, Junichi: *See—*
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Takahashi, Misao: *See—*
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Takahashi, Tsuyoshi: *See—*
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Takechi, Kazuo; Takahashi, Tsuyoshi; Inaba, Toyoaki; and Hasegawa, Eiichi, to Green Cross Corporation, The. Process for producing human lysozyme. 4,104,125, Cl. 195-66.00R.
Takeda Chemical Industries, Ltd.: *See—*
Sugihara, Hirosada; Watanabe, Masazumi; Motohashi, Michio; Nishikawa, Masao; and Sanno, Yasushi, 4,104,402, Cl. 424-330.000.
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Takeda, Yoshio: *See—*
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Talafuse, Larry J.: *See—*
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Weaver, Leslie A., 4,103,793, Cl. 214-506.000.
Tally, David N.: *See—*
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Tanaka, Akira; and Hollowell, William M., to American Safety Equipment Corporation. Roller seat back latch mechanism. 4,103,967, Cl. 297-216.000.
Tanaka, Katsumi; Hashimoto, Shigeru; Ohtaki, Shohei; Ito, Tadashi; Iwashita, Tomonori; and Kozuki, Susumu, to Canon Kabushiki Kaisha. Adaptor for providing a digital signal indicating the full open F number of an interchangeable photo-taking lens in a single lens reflex camera system. 4,104,649, Cl. 354-289.000.
Tanaka, Tadashi: *See—*
Tanikawa, Keiichi; Obi, Tatsuro; Tanaka, Tadashi; Otsuka, Susumu; and Saito, Takao, 4,104,419, Cl. 427-46.000.
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Tanbara, Nobuhiko: *See—*
Hasegawa, Katsumi; Ando, Akio; Yamazaki, Chikayasu; Okada, Morio; Aoi, Norihiro; and Tanbara, Nobuhiko, 4,103,833, Cl. 242-18.00A.
Tani, Yoshio: *See—*
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Tanigawa, Hisahiro: *See—*
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Taniguchi, Tadashi; Miyaoka, Takeshi; Hagino, Daiji; Matsumoto, Ken-ichi; Sakamoto, Kazuo; Matsuda, Akira; and Shishido, Toshio, to Citizen Watch Company Limited; and Doryokuro Kakunenryo Kaihatsu Jigyodan. Inspection machine for fuel pellets. 4,103,776, Cl. 209-73.000.
Tanikawa, Keiichi; Obi, Tatsuro; Tanaka, Tadashi; Otsuka, Susumu; and Saito, Takao, to Nippon Steel Corporation. Surface treatment of a tin-plate. 4,104,419, Cl. 427-46.000.
Tanimoto, Akikazu: *See—*
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Tankus, Harry, to Crane Packing Co. Elastic positive drive bellows seal. 4,103,904, Cl. 277-42.000.
Tarullo, John A. Method for making cork wall covering. 4,104,103, Cl. 156-309.000.
Tarumi, Noriyoshi; Tamura, Akihiko; and Kokiso, Masakazu, to Konishiroku Photo Industry Co., Ltd. Process for preparation of photoconductive powders of cadmium sulfide type materials. 4,104,065, Cl. 96-1.50R.
Tasker, John: *See—*
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Tate & Lyle Limited: *See—*
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Tattersall, Edward Gunston, to Hovermarine Transport Limited. Gas-cushion vehicles. 4,103,755, Cl. 180-117.000.
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Taylor, Charles E.: *See—*
Deinert, J. Clifford; Taylor, Charles E.; and Mumford, Harry W., 4,103,844, Cl. 242-107.000.
Taylor, James R., to Q-dot Corporation. Home laundry dryer. 4,103,433, Cl. 34-86.000.
Techniservice Division, Textured Yarn Co., Inc.: *See—*
List, Ralph W., 4,103,835, Cl. 242-18.00A.
Tecumseh Products Company: *See—*
Reese, Paul T., 4,103,660, Cl. 123-179.00K.
von Kaler, Roland L.; and Jolliff, Norman E., 4,103,566, Cl. 74-701.000.
Teknisk Konsult Sven Persson AB: *See—*
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Telsco Industries, Inc.: *See—*
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Tempkin, Robert M.: *See—*
Benjamin, Adrian; Churgin, Walter G.; Biermann, Frederick; Benjamin, David W.; Cordell, Finton P.; Tempkin, Robert M.; Zambrano, Carl A.; and Halasz, Peter, 4,103,424, Cl. 32-32.000.
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Tencor Instruments: *See—*
Wheeler, William R.; Kren, George J.; and Urbanek, Karel, 4,103,542, Cl. 73-105.000.
Tenneco Chemicals, Inc.: *See—*
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Terasaki, Wesley L.: *See—*
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Terlecki, Leo: *See—*
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Terrell, Ross C., to Airco, Inc. Ether compounds. 4,104,314, Cl. 260-614.00F.
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Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.
Tetra Pak Developpement, S.A.: *See—*
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Texaco Inc.: *See—*
Carter, Walter H.; Christopher, Charles A.; and Jefferson, Thomas, 4,104,193, Cl. 252-316.000.
Chou, Kechia J.; and Hellmuth, Walter W., 4,104,182, Cl. 252-51.50A.
Cole, Edward L.; Hess, Howard V.; and Guptill, Frank E., Jr., 4,104,035, Cl. 44-51.000.
Texas Instruments Incorporated: *See—*
Armstrong, James J., 4,104,702, Cl. 361-421.000.
Hewlett, Frank Wilson, Jr., 4,104,732, Cl. 365-179.000.
Kendall, Don L.; Ahlburn, Byron T.; and Wiemer, Klaus C., 4,104,697, Cl. 361-305.000.
Textile Associates, Inc.: *See—*
Resnick, Marvin; and Mounts, Stanley Homer, 4,103,389, Cl. 15-302.000.
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Theo Krebs AG: *See—*
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Thermo Electron Corporation: *See—*
Poirier, Victor L., 4,104,005, Cl. 417-394.000.
Theurer, Josef, to Franz Plasser Bahnbaumaschinen m.b.H. Ballast tamping machine. 4,103,622, Cl. 104-7.00R.
Thomas & Betts Corporation: *See—*
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Thomas, Frank J.; and Farrow, Max W., to Martin Marietta Corporation. Line scan area signature detection method. 4,103,847, Cl. 244-3.180.
Thomas J. Lipton, Inc.: *See—*
Pooler, John Dennis, 4,104,411, Cl. 426-421.000.
Thomas, Marion V. Bicycle holder. 4,103,923, Cl. 280-289.00L.
Thomas, Paul W., to Polaroid Corporation. Programming cam indexing mechanism. 4,103,569, Cl. 74-816.000.
Thome, Paul. Moving sealing junction with sealing strips controlled by mechanical operators. 4,103,912, Cl. 277-226.000.
Thompson, John Douglas. Combination bag and scoop. 4,103,952, Cl. 294-1.00R.
Thompson, Neil E. S.: *See—*
Oude Alink, Bernardus A.; and Thompson, Neil E. S., 4,104,249, Cl. 260-45.80N.
Thompson, Paul F., to General Cable Corporation. Semiconductive filling compound for power cable with improved properties. 4,104,480, Cl. 174-23.00C.
Thompson, William S., to Elkhart Brass Manufacturing Co., Inc. Ball valve having an improved ball element design. 4,103,868, Cl. 251-283.000.
Thomsen, Hans Thomas. Wheel unit for mounting in a suitcase. 4,103,391, Cl. 16-33.000.
Thomson-CSF: *See—*
Desormiere, Bernard; and Spitz, Erich, 4,103,988, Cl. 350-162.00R.
Thornburg, David D.; and Lahr, Roy J., to Xerox Corporation. Consumable credit card. 4,104,515, Cl. 235-488.000.
Thoro-Ray Inc.: *See—*
Weiss, Mortimer E., 4,104,530, Cl. 250-490.000.
Weiss, Mortimer E., 4,104,531, Cl. 250-490.000.
Weiss, Mortimer E., 4,104,532, Cl. 250-490.000.
Thuler, Oscar W., to Merz & Bentili Nuklear AG. Digitale, an indicating device containing liquid crystals. 4,104,627, Cl. 340-336.000.
Thuot, Michael E., to Westinghouse Electric Corp. Portable digital ohmmeter. 4,104,578, Cl. 324-28.0CR.
Thurner, Heinz Friedrich. Method and a device for ascertaining the degree of compaction of a bed of material with a vibratory compacting device. 4,103,554, Cl. 73-573.000.
Thyssen Industrie Aktiengesellschaft: *See—*
Schulz, Stefan, 4,104,738, Cl. 366-343.000.
Tidwell, Hubert. Wave and tide motor. 4,103,494, Cl. 60-648.000.
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Tinholt, Thomas H., to Eaton Corporation. Resilient support for coil of viscous fluid drive. 4,103,765, Cl. 192-58.00B.

Tip-Top-Saar Gesellschaft fur industrielle Vulkanisierung m.b.H.: *See—*
Steinborn, Wilhelm; and Mechenbier, Alois, 4,103,498, Cl. 61-45.00B.
Tipler, Donald Henry, to Schlegel (UK) Limited. Flush set lock for sliding doors. 4,103,946, Cl. 292-114.000.
Tisone, Thomas C.; Krueger, Helmut H. A.; Sobecks, Ronald S.; and Tauber, Richard N., to Design & Manufacturing Corporation. PTC heater for enhancing thermal actuator response. 4,104,507, Cl. 219-513.000.
Titz, Siegfried: *See—*
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TMC Corporation: *See—*
Krob, Erwin; Weigl, Erwin; and Svoboda, Josef, 4,103,916, Cl. 280-605.000.
Valoh, Alfons, 4,103,930, Cl. 280-614.000.
Tochitani, Tomotada: *See—*
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Toda, Toshiharu; and Shigemori, Daizo, to Reliable Electric Company. Gas filled surge arrester. 4,104,693, Cl. 361-120.000.
Tokico Ltd.: *See—*
Sakazume, Takeshi, 4,103,492, Cl. 60-588.000.
Tokuno, Masateru, to Rengo Co., Ltd. Board piling-up apparatus. 4,103,786, Cl. 214-7.000.
Tokuno, Masateru; Tanigawa, Hisahiro; Kaneko, Masayoshi; and Shinmura, Noboru, to Rengo Kabushiki Kaisha (Rengo Co., Ltd); and Nippon Riraiansu Kabushiki Kaisha (Japan Reliance Electric Ltd.). Method of controlling web cutting. 4,104,723, Cl. 364-475.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Koike, Hiroshi; Wakayama, Hideaki; Ohashi, Hiroshi; and Yokokura, Kunio, 4,104,496, Cl. 200-144.00B.
Toledo Astronomical Association: *See—*
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Tollinger, James, to Ithaca Gun Company, Inc. Firearm trigger mechanism. 4,103,586, Cl. 89-144.000.
Tolo, Incorporated: *See—*
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Tomes, William L.: *See—*
Sutcliffe, Grenville G.; Washausen, Roy F.; Tomes, William L.; and Gould, Herman Ray, 4,103,936, Cl. 285-26.000.
Tomita, Chuji; and Abe, Hiroshi, to Hitachi Medical Corporation. Scanning apparatus for cross-sectional inspection equipment. 4,104,527, Cl. 250-445.00T.
Tomiyama, Hitoshi: *See—*
Arita, Hidemasa; Tomiyama, Hitoshi; and Mori, Shigeyasu, 4,104,041, Cl. 55-90.000.
Tompsett, David Elliott: *See—*
Grau, Thomas George; and Tompsett, David Elliott, 4,104,109, Cl. 156-521.000.
Tonomura, Shinji: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,104,392, Cl. 424-258.000.
Tool Masters, Inc.: *See—*
Daigle, Milton L., 4,103,741, Cl. 166-147.000.
Toray Industries, Inc.: *See—*
Hasegawa, Katsumi; Ando, Akio; Yamazaki, Chikayasu; Okada, Morio; Aoi, Norihiro; and Tanbara, Nobuhiko, 4,103,833, Cl. 242-18.00A.
Totten, Roger W., to Adolph Coors Company. In-line bottle rinser. 4,104,081, Cl. 134-23.000.
Towsend, Marvin Stanley. Remote signaling system. 4,104,618, Cl. 340-524.000.
Toyo Boseki Kabushiki Kaisha: *See—*
Date, Masakazu; and Wada, Masahiro, 4,104,222, Cl. 260-29.20E.
Kato, Yasuo; Ikegami, Tadashi; Harukawa, Junichi; and Kato, Katsuhiko, 4,104,259, Cl. 528-169.000.
Tachibana, Yoshishige, 4,103,521, Cl. 68-22.00R.
Toyo Kogyo Co., Ltd.: *See—*
Shimoji, Masaharu; Tatsutomi, Yasuo; Hirose, Yutaka; Yamasaki, Atsumichi; and Kikura, Katsuaki, 4,103,666, Cl. 123-219.000.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Fujii, Sakumi; Uchida, Masao; and Watanabe, Osamu, 4,104,079, Cl. 134-2.000.
Kido, Shiro; Saito, Yuji; and Iwaeda, Toshinao, 4,104,208, Cl. 521-53.000.
Nagasawa, Mitsuru; Fujimoto, Teruo; and Tago, Kazuo, 4,104,455, Cl. 526-173.000.
Toyoda Gosei Kabushiki-Kaisha (Toyoda Synthetics Co., Ltd.): *See—*
Manabe, Katsuhide; Masumi, Jiro; Tochitani, Tomotada; and Shinoda, Kenzo, 4,104,432, Cl. 428-216.000.
Toyoda, Kenji; and Watanabe, Sakuji, to Nippon Kogaku K.K. Exposure control circuit for camera. 4,104,666, Cl. 354-234.000.
Toyoda, Kenji: *See—*
Sugimori, Shiro; and Toyoda, Kenji, 4,104,661, Cl. 354-173.000.
Toyoda-Koki Kabushiki-Kaisha: *See—*
Nishimura, Hideo; and Etoh, Kunihiko, 4,103,668, Cl. 125-11.0CD.
Traffic Systems, Inc.: *See—*
DiCola, Joseph A., 4,104,562, Cl. 315-158.000.
Trans-ACC, Inc.: *See—*
Francis, Walter C., 4,103,589, Cl. 90-56.00R.
Trauner, Gerhard; and Kiripolszki, Michael, to Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft. Steerable antenna arrangement. 4,104,640, Cl. 343-765.000.
Treasarden, Robert J., to Raymond Lee Organization, Inc., The, a part interest. Game. 4,103,890, Cl. 273-1.00E.
Tridon-Serflex S. A.: *See—*
Luc, Andre R., 4,103,637, Cl. 113-116.00M.
Trifsik, Mikhail Konstantinovich: *See—*
Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.
Trio Kabushiki Kaisha: *See—*
Tagawa, Masatoshi, 4,104,599, Cl. 331-116.00R.
Tritter, Alan Levi: *See—*
Markstein, Peter Willy; and Tritter, Alan Levi, 4,104,721, Cl. 364-200.000.
Trivedi, Bhupendra C., to Ashland Oil, Inc. Catalytic hydrogenation of fatty acids. 4,104,478, Cl. 568-885.000.
Troponwerke Dinklage & Co.: *See—*
Boltze, Karl-Heinz; Brendler, Otfried; and Seidel, Peter-Rudolf, 4,104,278, Cl. 260-326.13A.
True Temper Corporation: *See—*
Muchiarone, Jerome J., 4,104,639, Cl. 343-723.000.
Trulio, John G.; and Bless, Stephan J., to Applied Theory, Inc. Stress wave generator. 4,103,756, Cl. 181-121.000.
Trumpf Maschinen AG: *See—*
Herb, Eugen; and Brekle, Erich, 4,103,414, Cl. 29-568.000.
Tsergas, Athanase N., to Merkle-Korff Gear Co. Synchronous motor structure. 4,104,552, Cl. 310-156.000.
Tsubuko, Kazuo; and Kizu, Yasuo, to Ricoh Co., Ltd. Liquid developer for use in electrostatic photography comprising natural resins and natural resin-modified thermosetting resins combined with polymers. 4,104,183, Cl. 252-62.10L.
Tsuchida, Eishun; and Honda, Kenji, to Tsuchida, Eishun. Polymeric metal complex and method of manufacturing the same. 4,104,466, Cl. 542-433.000.
Tsuchikura, Toshio: *See—*
Kawada, Chikao; and Tsuchikura, Toshio, 4,103,451, Cl. 46-22.000.
Tsuchiya, Tsutomu: *See—*
Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Tsutomu, 4,104,372, Cl. 424-180.000.
Tsuruta, Hikaru: *See—*
Utsui, Masaaki; Tsuruta, Hikaru; Mizutani, Shigemitsu; and Shimizu, Shigehisa, 4,103,575, Cl. 83-298.000.
Tsypin, Nekhemyan Veniaminovich: *See—*
Fedoseev, Dmitry Valerianovich; Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; Varnin, Valentin Pavlovich; Vnukov, Stanislav Pavlovich; Gerasimenko, Valentin Korneevich; Nikitin, Jury Ivanovich; Tsypin, Nekhemyan Veniaminovich; and Hochko, Anatoly Vasilievich, 4,104,441, Cl. 428-408.000.
Tucker, Samuel M., to Robinson, John C.; Youngblood, Wade H.; and Briscoe, Harry H., part interest to each. Slasher vacuum cleaning system. 4,103,390, Cl. 28-173.000.
Turin, Michel J.: *See—*
Fauran, Claude P.; Turin, Michel J.; Imbert, Thierry F.; Raynaud, Guy M.; and Dorme, Nicole A. M., 4,104,384, Cl. 424-248.510.
Turman, Thomas Bray. Emergency opening latch actuator for sliding door. 4,103,945, Cl. 292-100.000.
Turner, Albert Harold, to United Technologies Corporation. Rotary seal with pressurized air directed at fluid approaching the seal. 4,103,899, Cl. 277-1.000.
Turner, Paul W.: *See—*
Luttrell, Edward; and Turner, Paul W., 4,104,499, Cl. 219-60.00A.
Tyler, Harold E. Waste bag for animals. 4,103,645, Cl. 119-95.000.
Uchida, Akinari: *See—*
Hachisu, Takeshi; and Uchida, Akinari, 4,104,206, Cl. 260-2.300.

Uchida, Masao: *See*—
Fujii, Sakumi; Uchida, Masao; and Watanabe, Osamu, 4,104,079, Cl. 134-2.000.
Uchiyama, Takashi; Sanada, Noriaki; Otaka, Teruo; Komiya, Yoshio; Okuno, Youichi; and Yokota, Hideo, to Canon Kabushiki Kaisha. Data printing device for camera. 4,104,658, Cl. 354-106.000.
Uebel, Philip, to Robert Bosch GmbH. Reciprocating tamping tool. 4,104,001, Cl. 404-133.000.
Ueda, Masaki: *See*—
Suzuki, Osamu; Ueda, Masaki; and Ishii, Akira, 4,104,436, Cl. 428-297.000.
Ueda, Takeo, to NSK-Warner K.K. Take-up force eliminator for safety belt retractor. 4,103,845, Cl. 242-107.700.
Ueda, Tomoyuki: *See*—
Nanba, Kamori; Ueda, Tomoyuki; and Matsuda, Tetsunori, 4,103,865, Cl. 251-148.000.
Ueno, Zene; Morita, Akira; and Chida, Atushi, to Nissan Motor Company, Limited. Method of and apparatus for controlling ignition timing of an internal combustion engine. 4,103,653, Cl. 123-117.00R.
Ueshima, Takashi; Tanaka, Yasuzi; Yokoyama, Toshiro; and Kobayashi, Shoichi, to Showa Denko K.K. Resin composition comprising cyano-substituted norborene polymers blended with graft copolymers. 4,104,325, Cl. 260-876.00R.
Ullmann, Karl Hans, to Harnischfeger Corporation. Shovel attachment means for hydraulic excavator. 4,103,791, Cl. 214-138.00R.
Ullmann, Werner; and Panschow, Rudolf, to A.G. fur industrielle Elektronik AGIE. Electro-erosion machine tool with compensation for operating forces, and method of operation. 4,104,502, Cl. 219-69.00W.
Ulrich, James K.: *See*—
Kampman, Lester R.; Ulrich, James K.; and Hodgson, James H., 4,103,475, Cl. 56-16.400.
Ultra Centrifuge Nederland N.V.: *See*—
Ijlstra, Hendrik Jan; and van den Boogaard, Gerardus Joachim Maria, 4,104,484, Cl. 174-151.000.
Scholtus, Christiaan Gustaaf Adolf; Lijbrink, Eduard; Meijer, Franciscus Alexander Theodorus; and Ruiter, Antonius, 4,103,816, Cl. 228-49.000.
Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Tsutomu, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. 1-N-(α-hydroxy-ω-aminoalkanoyl) derivatives of 3'-deoxykanamycin A and the production thereof. 4,104,372, Cl. 424-180.000.
Umezawa, Sumio: *See*—
Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Tsutomu, 4,104,372, Cl. 424-180.000.
Union Carbide Corporation: *See*—
Chiu, Herman Shin-Gee, 4,104,408, Cl. 426-135.000.
Durden, John A., Jr.; Sousa, Anthony A.; and Stephen, John F., 4,104,043, Cl. 71-107.000.
Grose, Robert William; and Flanigen, Edith Marie, 4,104,294, Cl. 260-448.00C.
Hedblom, Mats-Olov; and Sultan, Sven Gilbert, 4,104,256, Cl. 260-45.95D.
Pike, Roscoe A., 4,104,296, Cl. 260-448.80R.
Sara, Raymond Vincent, 4,104,417, Cl. 427-37.000.
Simroth, Donald W., 4,104,236, Cl. 260-33.20R.
Union Oil Company of California: *See*—
Stechmeyer, Frank W., 4,104,171, Cl. 252-8.300.
Union Siderurgique du Nord et de l'Est de la France: *See*—
Dussart, Bernard Emile Andre, 4,103,730, Cl. 164-49.000.
Unipat Corporation of America II: *See*—
Witcraft, Richard L., 4,103,573, Cl. 82-93.000.
Uniroyal, Inc.: *See*—
Covey, Rupert A.; and Grahame, Robert E., Jr., 4,104,401, Cl. 424-303.000.
Unisearch Limited: *See*—
Frost, Richard Butler; Juhasz, Joseph Laszlo; and Wing, Barry Walter, 4,103,809, Cl. 224-5.00R.
United States of America
Agriculture: *See*—
Gonsior, Michael J., 4,103,784, Cl. 212-94.000.
Zornig, Harold F., 4,103,825, Cl. 237-1.00A.
Air Force: *See*—
Ipri, Alfred C.; and Flatley, Doris W., 4,104,087, Cl. 148-1.500.
Army: *See*—
Hildebrandt, Herman F., 4,104,364, Cl. 423-481.000.
Rahman, Abdul R.; and Deneke, Wayne A., 4,104,414, Cl. 426-599.000.
Singer, Abraham; and Minkowski, Jan M., 4,104,587, Cl. 324-95.000.
Commerce: *See*—
Engen, Glenn F., 4,104,583, Cl. 324-58.00A.
Energy: *See*—
Forster, George A., 4,103,555, Cl. 73-706.000.
Garrett, George A.; and Shacter, John, 4,104,037, Cl. 55-16.000.
Luttrell, Edward; and Turner, Paul W., 4,104,499, Cl. 219-60.00A.
Health, Education and Welfare: *See*—
Walker, Elijah C., 4,103,893, Cl. 273-106.50D.
Interior: *See*—
Bradburn, Robert A., 4,104,544, Cl. 307-297.000.
Cole, Ernest R., Jr., 4,104,132, Cl. 204-12.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Friedell, Morley V. Positive isolation disconnect. 4,103,712, Cl. 137-637.050.
Menichelli, Vincent J. Electroexplosive device. 4,103,619, Cl. 102-28.00R.
National Aeronautics and Space Administration: *See*—
Alley, Vernon L., Jr.; and McHatton, Austin D., 4,103,550, Cl. 73-159.000.
Evans, John C., Jr., 4,104,084, Cl. 136-89.0CC.
Evans, John C., Jr.; Brandhorst, Henry W., Jr.; Mazaris, George A.; and Scudder, Larry R., 4,104,091, Cl. 148-188.000.
McKay, Richard A., 4,104,018, Cl. 432-29.000.
Roberts, Marion L.; Sharpe, Max H.; and Krupnick, Albert C., 4,104,134, Cl. 204-37.00R.
Navy: *See*—
Bernett, Marianne K., 4,104,452, Cl. 526-3.000.
Bohli, William H., 4,104,708, Cl. 362-34.000.
Chu, Wesley W.; and Korff, Phillip B., 4,104,719, Cl. 364-200.000.
Herndon, John W., 4,103,435, Cl. 35-12.00N.
Holt, Lloyd J.; and Panlaqui, Clayton E., 4,103,849, Cl. 244-63.000.
Iverson, Myren L., 4,104,533, Cl. 250-551.000.
Jones, William Kinzy, 4,104,607, Cl. 338-309.000.
Melling, Norman D.; De Matteo, John J.; Levrant, Melvyn A.; and Juels, Ronald J., 4,104,608, Cl. 340-3.0PS.
Transportation: *See*—
Vrabel, Joseph D., 4,103,547, Cl. 73-146.000.
U.S. Philips Corporation: *See*—
Schroder, Johann, 4,104,185, Cl. 252-70.000.
Van Bokestal, Andre Marcel Alfred; and Belhomme, Charles Joseph Ghislain, 4,104,509, Cl. 219-544.000.
Zandveld, Paul, 4,104,085, Cl. 148-1.500.
United States Steel Corporation: *See*—
Bucchianeri, Bernard A.; and Senchur, Robert A., 4,103,552, Cl. 73-309.000.
Capriotti, Alfred J.; Gana, John; and Korpela, Thomas J., 4,103,903, Cl. 277-27.000.
Didycz, William J.; Glassman, Donald; Maier, Edward E.; and Saniga, George T., 4,104,131, Cl. 203-7.000.
Fields, Marvin C.; and Wyse, Richard F., 4,104,129, Cl. 201-17.000.
United Technologies Corporation: *See*—
Beckmann, Peter V.; and Kelly, James B., 4,103,544, Cl. 73-115.000.
Johnson, Raymond G., Jr.; Cotton, Lou S.; and Verzella, David J., 4,103,848, Cl. 244-17.130.
Turner, Albert Harold, 4,103,899, Cl. 277-1.000.
Universal Electric Company: *See*—
Penhorwood, Herbert F., 4,104,550, Cl. 310-71.000.
University of Virginia: *See*—
Brooker, Gary; Terasaki, Wesley L.; and Price, Michael G., 4,104,026, Cl. 23-230.00B.
Unz, Hillel. Nonuniformly optimally spaced array with specified sidelobe positions in the radiation pattern. 4,104,641, Cl. 343-844.000.
UOP Inc.: *See*—
Antos, George J., 4,104,317, Cl. 260-666.00A.
Christman, William J., 4,104,155, Cl. 208-235.000.
Hilfman, Lee, 4,104,152, Cl. 208-112.000.
Martan, Michael; and Halter, Mark A., 4,104,141, Cl. 204-78.000.
Mitsche, Roy T.; and Pope, George N., 4,104,154, Cl. 208-138.000.
Veinerman, Elliot; Felch, Donald E.; and Peters, Kenneth D., 4,104,149, Cl. 208-64.000.
Ward, Dennis J., 4,104,321, Cl. 260-677.00A.
Upjohn Company, The: *See*—
Bundy, Gordon L., 4,104,476, Cl. 560-61.000.
Curtiss, John N.; Koehler, Charles E.; and Murray, Pat L., 4,104,346, Cl. 264-51.000.
Smith, Herman W., 4,104,474, Cl. 560-53.000.
Urbanczyk, Marvin L. Manure treating process. 4,104,048, Cl. 71-9.000.
Urbanek, Karel: *See*—
Wheeler, William R.; Kren, George J.; and Urbanek, Karel, 4,103,542, Cl. 73-105.000.
Urrea, Petronio D.: *See*—
Sibley, Murray J.; Yung, Gordon H. K.; and Urrea, Petronio D., 4,104,187, Cl. 252-106.000.
Utsui, Masaaki; Tsuruta, Hikaru; Mizutani, Shigemitsu; and Shimizu,

Shigehisa, to Fuji Photo Film Co., Ltd. Synchronous web cutting apparatus. 4,103,575, Cl. 83-298.000.
Valadares, Alvaro Neff: *See—*
Cruz, Edmundo Novas; and Valadares, Alvaro Neff, 4,103,615, Cl. 101-120.000.
Valcour Imprinted Papers, Inc.: *See—*
Collins, Frederick H., 4,104,440, Cl. 428-402.000.
Valenti, Salvatore, to Sandoz Ltd. 1,3,4-Oxadiazolyl-(2)-vinyl stilbene optical brighteners. 4,104,468, Cl. 542-447.000.
Valint, Paul L.: *See—*
Oswald, Alexis A.; and Valint, Paul L., 4,104,378, Cl. 424-225.000.
Valmet Oy: *See—*
Koskimies, Ouni, 4,104,116, Cl. 162-343.000.
Matikainen, Martti; and Ovaska, Juhani, 4,103,565, Cl. 74-665.00L.
Valoh, Alfons, to TMC Corporation. Heel holder for ski bindings. 4,103,930, Cl. 280-614.000.
Van Bokestal, Andre Marcel Alfred; and Belhomme, Charles Joseph Ghislain, to U.S. Philips Corporation. Self-regulating heating element. 4,104,509, Cl. 219-544.000.
van den Boogaard, Gerardus Joachim Maria: *See—*
Ijlstra, Hendrik Jan; and van den Boogaard, Gerardus Joachim Maria, 4,104,484, Cl. 174-151.000.
Vanderlinde, William: *See—*
Mathis, Thomas C.; Morgan, Albert W.; and Vanderlinde, William, 4,104,233, Cl. 260-31.8HA.
Vanek, Chester F. Autoloading pistol. 4,103,587, Cl. 89-175.000.
Vanheerentals, Jacques Leon; Pfeifer, Josef; Klocke, Helmut; and Paulus, Rudolf, to AGFA-Gevaert, AG. Method of determining exposure times for photographic copying material. 4,104,069, Cl. 96-23.000.
Van Niel, Clarence R., to Eaton Corporation. Monitor actuating device and reusable fastener therefor. 4,104,622, Cl. 340-572.000.
Van Roessel, Frederik Johannes, to North American Philips Corporation. Video switching circuit. 4,104,678, Cl. 358-30.000.
van Staveren, Hendricus Cornelis: *See—*
Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, 4,103,476, Cl. 56-13.600.
Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and by Deeva, Alexandra Ivanovna, administratrix. Portable drilling machine. 4,103,745, Cl. 173-57.000.
Varnin, Valentin Pavlovich: *See—*
Fedoseev, Dmitry Valerianovich; Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; Varnin, Valentin Pavlovich; Vnukov, Stanislav Pavlovich; Gerasimenko, Valentin Korneevich; Nikitin, Jury Ivanovich; Tsypin, Nekhemyan Veniaminovich; and Hochko, Anatoly Vasilievich, 4,104,441, Cl. 428-408.000.
Vaslas, John W. Snow shovel. 4,103,954, Cl. 294-54.000.
Vasquez, Joe M. Z. Fly trap. 4,103,449, Cl. 43-111.000.
Vavilov, Igor Stepanovich: *See—*
Mikotin, Evgeny Emelyanovich; Trifsik, Mikhail Konstantinovich; Vavilov, Igor Stepanovich; Mangubi, Jury Danilovich; Timofeev, Boris Andreevich; Timofeev, Anatoly Filippovich; Ryvkis, Yakov Mikhailovich; Aizenkaid, Mark Moiseevich; Samusenkov, Nikolai Vasilievich; Ermolaev, Alexandr Ivanovich; Zuev, Anatoly Andreevich; Antonov, Vladimir Alexandrovich; Kosogov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.
Veba-Chemie Aktiengesellschaft: *See—*
Hahn, Heinrich; Heumann, Hans; Liebing, Heinz; Schweppe, Manfred; and Hilt, Walter, 4,104,362, Cl. 423-315.000.
Veinerman, Elliot; Felch, Donald E.; and Peters, Kenneth D., to UOP Inc. Multiple-stage hydrocarbon conversion with gravity-flowing catalyst particles. 4,104,149, Cl. 208-64.000.
Veloz, Jaime: *See—*
Fountain, Gerald F.; Veloz, Jaime; Bilson, Edward A.; and Cronin, John A., 4,104,157, Cl. 209-166.000.
Velsicol Chemical Corporation: *See—*
Smith, Ray E.; and Albright, James A., 4,104,172, Cl. 252-8.100.
Venus Scientific Inc.: *See—*
Cohen, David A.; and Lien, Charles, 4,104,564, Cl. 315-171.000.
Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft: *See—*
Trauner, Gerhard; and Kiripolszki, Michael, 4,104,640, Cl. 343-765.000.
Vernon, Harry Rowe: *See—*
Wynn, John Dee; Denton, George Terrance; Bell, Richard Judd; Vernon, Harry Rowe; and Custer, Lloyd Roy, 4,104,413, Cl. 426-582.000.
Versar, Inc.: *See—*
Frankel, Irwin, 4,104,395, Cl. 264-60.000.
Verschage, Gerald C.: *See—*
Fisk, Bernard C.; and Verschage, Gerald C., 4,104,726, Cl. 364-518.000.
Verzella, David J.: *See—*
Johnson, Raymond G., Jr.; Cotton, Lou S.; and Verzella, David J., 4,103,848, Cl. 244-17.130.
Vezzani, Luciano. Metal scrap compacting press. 4,103,610, Cl. 100-232.000.
Victor, Floyd Ray, to Rice Hydro Equipment Manufacturing. Means and method of hydrostatic testing. 4,103,537, Cl. 73-40.50R.
Vigelius, Wolf-Dieter; Satzinger, Gerhard; and Herrmann, Manfred, to Warner-Lambert Company. Dibenzyl glycolic acid derivatives. 4,104,380, Cl. 424-244.000.
Vik, Albam M., to Avon Enterprises, Inc. Fluid cylinder mounted lock out valve device. 4,103,699, Cl. 137-106.000.
Vilaldach, Joseph: *See—*
Boujard, Claude; and Vilaldach, Joseph, 4,104,082, Cl. 134-141.000.
Vincent, David N.; and Chang, Cheng-Hsiung, to Champion International Corporation. Pressure-sensitive copy system including ureido fluoran chromogenic compounds. 4,104,437, Cl. 428-307.000.
Vincent, Gary A.: *See—*
Brooks, William T.; and Vincent, Gary A., 4,104,184, Cl. 252-63.700.
Vinnemann, Antonius: *See—*
Schmid, Manfred; Sommer, Werner; and Vinnemann, Antonius, 4,103,517, Cl. 66-75.100.
Vitzthum, Otto; Hubert, Peter; and Sirtl, Wolfgang, to Studiengesellschaft Kohle mbH. Production of hop extracts. 4,104,409, Cl. 426-386.000.
Vnukov, Stanislav Pavlovich: *See—*
Fedoseev, Dmitry Valerianovich; Deryagin, Boris Vladimirovich; Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; Varnin, Valentin Pavlovich; Vnukov, Stanislav Pavlovich; Gerasimenko, Valentin Korneevich; Nikitin, Jury Ivanovich; Tsypin, Nekhemyan Veniaminovich; and Hochko, Anatoly Vasilievich, 4,104,441, Cl. 428-408.000.
Vogel, Roger F.: *See—*
Hupp, Stephen S.; Sabourin, Edward T.; Swift, Harold E.; and Vogel, Roger F., 4,104,318, Cl. 260-669.00A.
Vogele, Peter; and Schulte, Diethard, to Tetra Pak Developpement, S.A. Process for sterilization, more particularly for sterilization of packaging materials. 4,104,024, Cl. 21-58.000.
Vogt, Wilhelm: *See—*
Zoche, Gunter; Richtzenhain, Hermann; and Vogt, Wilhelm, 4,104,300, Cl. 260-544.00D.
Vollmer, Hans-Peter: *See—*
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Vollmer, Robert Lee: *See—*
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Von Basse, Paul-Werner: *See—*
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von Kaler, Roland L.; and Jolliff, Norman E., to Tecumseh Products Company. Transaxle. 4,103,566, Cl. 74-701.000.
von Strandtmann, Maximilian: *See—*
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Mullet, David; Rilling, Raymond J.; and Voth, Elmer D., 4,103,477, Cl. 56-202.000.
Vozka, Stanislav; Spacek, Pavel; and Kubin, Miroslav, to Ceskoslovenska akademie ved. Method for preparation of perfectly spherical particles of silicagel with controlled size and controlled pore dimensions. 4,104,363, Cl. 423-338.000.
Vrabel, Joseph D., to United States of America, Transportation. Locomotive track curvature indicator. 4,103,547, Cl. 73-146.000.
Vukkert, Alexandr Adolfovich: *See—*
Varich, Mikhail Sidorovich; Grigoriev, Vladimir Konstantinovich; Chugunov, Viktor Dmitrievich; Dmitriev, Alexei Pavlovich; Kutuzov, Boris Nikolaevich; Shmidt, Rudolf Genrikhovich; Narinsky, Isaak Emmanuilovich; Vukkert, Alexandr Adolfovich; Shnapir, Yakov Isaakovich; Soldatov, Viktor Alexeevich; Antoshenkov, Vladimir Ilich; Deev, Pavel Ivanovich, deceased; and Deeva, Alexandra Ivanovna, administratrix, 4,103,745, Cl. 173-57.000.

Vukoje, Tatjana, to Akzona Incorporated. Variable diameter yarn. 4,103,481, Cl. 57-140.00J.

W & H Conveyor Systems, Inc.: *See*—
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W. R. Grace & Co.: *See*—
Bieler, Anne C.; and Schirmer, Henry G., 4,104,404, Cl. 428-35.000.

W. Schlafhorst & Co.: *See*—
Kupper, Willi, 4,103,836, Cl. 242-35.60E.

Wada, Masahiro: *See*—
Date, Masakazu; and Wada, Masahiro, 4,104,222, Cl. 260-29.20E.

Wade, Peter C.; and Kissick, Thomas P., to E. R. Squibb & Sons, Inc. 3-(Arylcycloiminoalkyl)benzisothiazole 1,1-dioxides. 4,104,387, Cl. 424-250.000.

Wade, Peter C.; and Kissick, Thomas P., to E. R. Squibb & Sons, Inc. 3-Substituted benzisothiazole, 1,1-dioxides. 4,104,388, Cl. 424-250.000.

Wagener, Heinz-Jurgen: *See*—
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Wagner, Jerome, to Fraider, Harry. Brush tender. 4,103,779, Cl. 211-65.000.

Wagner, Walter D.; and Gayle, Harold R., to Sun Oil Company of Pennsylvania. Pressure stabilizer device. 4,103,705, Cl. 137-544.000.

Wagner, Wolfram: *See*—
Rellensmann, Wolfgang; Bueb, Michael; Rupprecht, Lothar; Schmidt, Herbert; and Wagner, Wolfram, 4,103,480, Cl. 57-140.00R.

Wagoner, James E., to Toledo Astronomical Association. Sun and star time dial. 4,103,429, Cl. 33-270.000.

Wakami, Noboru; and Deguchi, Masahiro, to Matsushita Electric Industrial Co., Ltd. Rotary head type magnetic video recording and reproducing system. 4,104,684, Cl. 360-70.000.

Wakayama, Hideaki: *See*—
Koike, Hiroshi; Wakayama, Hideaki; Ohashi, Hiroshi; and Yokokura, Kunio, 4,104,496, Cl. 200-144.00B.

Wakefield, Fancher B., to Grumman Aerospace Corporation. Self-aligning permanent fitting. 4,103,937, Cl. 285-110.000.

Walker, Duane Hubert, to National Presto Industries, Inc. Pressure cooker with manually-operated cover interlock. 4,103,801, Cl. 220-203.000.

Walker, Edward Piper: *See*—
Newbould, Adrian Orton; Walker, Edward Piper; and Williams, Anthony, 4,104,586, Cl. 324-83.00D.

Walker, Elijah C., to United States of America, Health, Education and Welfare. Tranquilizer dart. 4,103,893, Cl. 273-106.50D.

Walker, James J.: *See*—
Bahder, George; Eager, George S., Jr.; Dima, Attila F.; and Walker, James J., 4,104,479, Cl. 174-22.00R.

Walker, Louis, to Ascani, Armand; and Piattoni, Louis J., part interest to each. Method and means for improved air distribution. 4,103,599, Cl. 98-33.00A.

Walker, Richard Turner. Drying apparatus. 4,103,434, Cl. 34-114.000.

Wallrabenstein, Michael: *See*—
del Rio, Marija; Behnke, Joachim; Wallrabenstein, Michael; and Frank, Dieter, 4,104,258, Cl. 528-334.000.

Walsh, Fraser M.; Crouse, Dennis N.; and Ajami, Alfred M., to Eco-Control, Inc. Halogen complexing alkyl salts for use in halogen cells. 4,104,447, Cl. 429-15.000.

Walt Disney Productions: *See*—
Hinze, George B., 4,103,892, Cl. 273-101.100.

Walters, Harry Godfrey, III: *See*—
Humble, David Raymond; and Walters, Harry Godfrey, III, 4,103,572, Cl. 81-418.000.

Wambach, Allen Dale: *See*—
Kochanowski, John Edward; and Wambach, Allen Dale, 4,104,242, Cl. 260-40.00R.

Wang, Shih-Ping; Robbins, Charles D.; and Merritt, Elisha, to Diagnostic Information Inc. Direct view, panel type x-ray image intensifier tube. 4,104,516, Cl. 250-213.0VT.

Ward, Dennis J., to UOP Inc. Process for the separation of olefins. 4,104,321, Cl. 260-677.00A.

Ward, Gene R., to Minnesota Mining and Manufacturing Company. Method of making structural member from prepreg sheet of fusible resin microfibers and heat-resistant reinforcing fibers. 4,104,340, Cl. 264-6.000.

Ward, Gerald Frank; and Wray, Gordon Richard, to National Research Development Corporation. Method for inserting seams in base fabric. 4,103,636, Cl. 112-266.000.

Ward, James O.: *See*—
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Warner, Albert Woodrow. Heat exchanger. 4,103,735, Cl. 165-39.000.

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Warner-Lambert Company: *See*—
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Schwender, Charles F.; and Sunday, Brooks R., 4,104,389, Cl. 424-251.000.
Vigelius, Wolf-Dieter; Satzinger, Gerhard; and Herrmann, Manfred, 4,104,380, Cl. 424-244.000.

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Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; Hashimoto, Sadakatsu; Takeda, Yoshio; Ishii, Mitsuo; and Kitanishi, Yoshitomo, to Sharp Kabushiki Kaisha. Liquid crystal display calculator construction. 4,104,727, Cl. 364-710.000.

Wasilewski, Olgierd; Saltzman, Ronald; and Ferrara, William J., to Sun Chemical Corporation. Inks and coating compositions containing rosin-modified epoxy resins. 4,104,143, Cl. 204-159.150.

Wass, Richard J. Heat exchanger for a freestanding heating unit. 4,103,826, Cl. 237-55.000.

Watanabe, Akinori; Noguchi, Matsusaburo; and Ota, Toshimichi, to Oki Electric Industry Co., Ltd. Ink mist type high speed printer. 4,103,612, Cl. 101-1.000.

Watanabe, Masanori: *See*—
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Watanabe, Masazumi: *See*—
Sugihara, Hirosada; Watanabe, Masazumi; Motohashi, Michio; Nishikawa, Masao; and Sanno, Yasushi, 4,104,402, Cl. 424-330.000.

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Watson, Francis M., III: *See*—
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Watson, Theodore R.: *See*—
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Weaver, Charles A., to P.R. Mallory & Co. Inc. Capacitor including an electroplated layer thereover. 4,104,704, Cl. 361-433.000.

Weaver, Gerald Q., to Norton Company. Process for making aluminum modified boron carbide and products resulting therefrom. 4,104,062, Cl. 75-238.000.

Weaver, Leslie A., to Talbert Manufacturing, Inc. Folding gooseneck trailer with positioning system. 4,103,793, Cl. 214-506.000.

Webb, Robert Lee: *See*—
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Weigl, Erwin: *See*—
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Weigle, Wayne L.; Fogle, Edgar L.; Cromer, Oscar M.; and Schafer, Larry C., to Westinghouse Electric Corp. Method and system for clutter blanking in a radar target processor. 4,104,631, Cl. 343-7.00A.

Weimar, Erich: *See*—
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Weimer, Dean R.; and Durr, Albert M., to Continental Oil Company. Method for reducing PVC polymer buildup in polymerization reactors. 4,104,454, Cl. 526-62.000.

Wein, Gary M., to Nalco Chemical Company. Method for treating

aqueous wastes containing at least 1% proteinaceous matter. 4,104,161, Cl. 210-54.000.
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Weisenborn, Frank Lee; Haugwitz, Rudiger D.; and Hauck, Frederic Peter, to E. R. Squibb & Sons, Inc. Imidazo(2,1-b)thiazole derivatives, compositions containing same, and method of treating helminthiasis. 4,104,400, Cl. 424-270.000.
Weiss, Charles M.; and Judy, Kenneth W. M., to Oratronics, Inc. Threaded self-tapping endodontic stabilizer. 4,103,422, Cl. 32-10.00A.
Weiss, Frederick A. Extensible vehicle trailer with safety locking bar and cable and hose supporting outriggers. 4,103,931, Cl. 280-656.000.
Weiss, Marvin; Adams, Phillip; Nass, Gerald I.; and Leitner, Roland L., to Kewanee Industries. Radiation-curable coating compositions and inks. 4,104,144, Cl. 204-159.230.
Weiss, Mortimer E., to Thoro-Ray Inc. Dental and medical X-ray apparatus. 4,104,530, Cl. 250-490.000.
Weiss, Mortimer E., to Thoro-Ray Inc. Electron beam target carrier with ceramic window for dental or medical X-ray use. 4,104,531, Cl. 250-490.000.
Weiss, Mortimer E., to Thoro-Ray Inc. Dental and medical X-ray apparatus. 4,104,532, Cl. 250-490.000.
Weitzenhof, David A.: *See—*
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Wessel, Otto; Hofmann, Georg; Gesell, Hartmut; and Scholz, Werner, to Mannesmann Aktiengesellschaft. Method for making metal powder of low oxygen content. 4,104,342, Cl. 264-12.000.
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Kuhn, Earl C., 4,103,979, Cl. 308-160.000.
Morrison, Steven; and Dorman, William J., 4,104,730, Cl. 364-815.000.
Parziale, Ernest A.; and Richardson, Dennis C., 4,104,117, Cl. 176-20.00R.
Shimp, Alan B.; Meyer, Thomas N.; and Elms, Robert T., 4,104,691, Cl. 361-96.000.
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Wheeler, Jay A.; Miszkiewicz, Henry L.; Lindberg, Ronald O. J.; and Willmore, James A., to HEI, Inc. Tactile feel device. 4,104,603, Cl. 335-306.000.
Wheeler, William R.; Kren, George J.; and Urbanek, Karel, to Tencor Instruments. Metrology instrument for measuring vertical profiles of integrated circuits. 4,103,542, Cl. 73-105.000.
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White, E. Vernon. Valve guard for protecting the regulator valve on a scuba tank. 4,103,806, Cl. 222-3.000.
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Whitney, Thomas A.; and Klemann, Lawrence P., to Exxon Research & Engineering Co. Alkali metal batteries having electrolytes including alkali metal salts of complex anions containing heteroatom substituents in organic solvent. 4,104,450, Cl. 429-194.000.
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Widolf, Philip R., to Woody-Widolf, Inc. Skateboard truck. 4,103,917, Cl. 280-11.280.
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Williams, George C., to Alden Research Foundation. Framing pulse generator for facsimile recorder. 4,104,644, Cl. 346-139.00A.
Williams, John R., to Temple University. Photosensitization of oxygen to the singlet excited state using ion exchange resin to which is attached a dye and photooxidative waste water treatment. 4,104,204, Cl. 521-32.000.
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Williams, Rudolph. Cooling vent attachment for side window of aircraft. 4,103,597, Cl. 98-2.120.
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Winkler, Alfred; Lermann, Peter; Engelsmann, Dieter; and Fauth, Gunter, to AGFA-Gevaert, AG. Film advance mechanism for still cameras. 4,104,664, Cl. 354-213.000.
Winkler, Friedrich; Theer, Anton; Lermann, Peter; Stenzenberger, Volkmar; Griessner, Peter; Sandl, Dieter; Muller, Hermann; and Wilsch, Herbert, to AGFA-Gevaert, AG. Motion picture camera with variable focal length lens. 4,103,993, Cl. 352-140.000.
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Witt, Wilbur W. Universal lead forming tool for dual-in-line integrated circuit packages. 4,103,719, Cl. 140-147.000.
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Woo, Gar Lok; and House, Ralph, to Chevron Research Company. Ring polysulfonated alkylphenoxy alkylols as detergents. 4,104,023, Cl. 8-137.000.
Wood, Richard G. Child's telephone apparatus. 4,103,452, Cl. 46-33.000.
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Woody-Widolf, Inc.: *See—*
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Worley, Arthur C., to Exxon Research & Engineering Co. Non-destructive refractory erosion indicator. 4,103,539, Cl. 73-86.000.
Wortche, Rudolf: *See—*
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Wurster, James C.: *See—*
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Wynn, John Dee; Denton, George Terrance; Bell, Richard Judd; Vernon, Harry Rowe; and Custer, Lloyd Roy, to Anderson, Clayton & Co. Preparation of imitation cheese. 4,104,413, Cl. 426-582.000.
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Wyss, Georges, to Ateliers des Charmilles S.A. Device for electrical discharge machining with simultaneous relative advance and cycle translational movement of the electrodes. 4,104,500, Cl. 219-69.00V.
Wyss, Georges, to Ateliers des Charmilles S.A. Method of electrical discharge machine with simultaneous relative advance and cyclic translational movement of the electrodes. 4,104,501, Cl. 219-69.00M.
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Yamazaki, Shuichi; Shimada, Shinichi; Sato, Yasuhito; and Shirakura, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Engine exhaust port liner system. 4,103,487, Cl. 60-282.000.

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Yerushalmi, Joseph; Ehrlich, Shelton; Maaghoul, Mohammad, deceased (by Maaghoul, Nassrine S., administratrix); and Lund, Terry E., to Electric Power Research Institute, Inc. Apparatus and method for combusting carbonaceous fuels employing in tandem a fast bed boiler and a slow boiler. 4,103,646, Cl. 122-4.00D.

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Yokokawa, Takao; Takano, Shigeo; Ichinose, Yasuaki; Kasahara, Toshiyuki; and Ikeda, Fumiaki, to Nippon Steel Corporation. Gas pressure welding system. 4,103,815, Cl. 228-9.000.

Yokokura, Kunio: *See*—
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Yonker, John H., to Otis Engineering Corporation. Well tool with a pawl. 4,103,740, Cl. 166-117.500.

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York, James A.: *See*—
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Zagara, Frank A.; and Nelson, John M., to Bernzomatic Corporation. Portable oxypropane torch. 4,103,829, Cl. 239-304.000.

Zahn, Wolfgang: *See*—
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Zandveld, Paul, to U.S. Philips Corporation. Method of manufacturing a semiconductor device by implanting ions through bevelled oxide layer in single masking step. 4,104,085, Cl. 148-1.500.

Zdanovsky, Mikhail Romanovich; Minashin, Viktor Vasilievich; Nikolaev, Vladimir Yakovlevich; Razuvaev, Viktor Alexandrovich; Perelygin, Ivan Petrovich; Mikhaevich, Stanislav Leonidovich; and Dridze, Lev Samuilovich. Centering clamping device. 4,103,915, Cl. 279-119.000.

Zeck, Walter Maria, to Mobay Chemical Corporation. Synergistic composition for the control of insects. 4,104,376, Cl. 424-216.000.

Zelinski, Robert P., to Phillips Petroleum Company. Coupling of alkali metal-terminated polymers. 4,104,332, Cl. 260-880.00B.

Zepf, Hans-Rudolf. Adjustable shovel tooth cap holder. 4,103,442, Cl. 37-142.00R.

Zhevnerov, Sergei Vasilievich. Digital device for measuring instantaneous parameter values of slowly varying processes. 4,104,590, Cl. 324-166.000.

Ziese, Joe W. Utility compartment for a travel trailer. 4,103,960, Cl. 296-37.100.

Zink, Frederick J.: *See*—
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Zoche, Gunter; Richtzenhain, Hermann; and Vogt, Wilhelm, to Dynamit Nobel Aktiengesellschaft. Method of preparing carboxylic acid chlorides of the benzene series. 4,104,300, Cl. 260-544.00D.

Zollinger, Max. Apparatus for sequentially treating one or more specimens of cellular material with a plurality of treating liquids. 4,103,722, Cl. 141-70.000.

Zornig, Harold F., to United States of America, Agriculture. Solar heated and cooled dwelling. 4,103,825, Cl. 237-1.00A.

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gov, Evgeny Efremovich; Aldakushin, Stanislav Andreevich; Yanin, Viktor Gavrilovich; Mazurik, Vitaly Ivanovich; Teslya, Ivan Nikiforovich; Burakov, Savely Leonidovich; Soloviev, Petr Petrovich; and Snezhnoi, Rostislav Lukyanovich, 4,103,734, Cl. 164-309.000.

Zulaski, John A., to S&C Electric Company. Device for detecting unbalanced conditions in a polyphase equipment bank. 4,104,687, Cl. 361-17.000.

Zuna, Jaroslav: *See*—
Kovar, Jiri; Kafunek, Pavel; Reichel, Pavel; Pokorny, Oldrich; Pellant, Michal; Kratina, Jindrich; and Zuna, Jaroslav, 4,104,677, Cl. 357-81.000.

Zwack, Robert R.: *See*—
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LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 1ST DAY OF AUGUST, 1978

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Beyers, Marvin E., to Caterpillar Tractor Co. Replaceable tire tread belt and tire carcass with a buttressed sidewall. T973,006, 8-1-78, Cl. 152-176.000.

Beyers, Marvin E., to Caterpillar Tractor Co. Replaceable tire tread belt. T973,007, 8-1-78, Cl. 152-176.000.

Caterpillar Tractor Co.: *See*—
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Beyers, Marvin E., T973,007, Cl. 152-176.000.
Cole, Carroll R.; and Ohms, Edward J., T973,001, Cl. 37-126.0AD.
Frantzreb, John G., Sr., T973,009, Cl. 164-50.000.
Kelly, Orson K.; and Perez, Henry J., T973,003, Cl. 70-200.000.
Klett, Gene R., T973,002, Cl. 37-142.00R.
Shyu, Tsu Pin; and Lofquist, Byron H., T973,005, Cl. 74-574.000.

Chadwick, Julian Burrell; and Kendall, Victor George. Cathodically protected polyolefin coated pipelines. T973,015, 8-1-78, Cl. 428-36.000.

Cole, Carroll R.; and Ohms, Edward J., to Caterpillar Tractor Co. Scraper apron assembly. T973,001, 8-1-78, Cl. 37-126.0AD.

Ferrara, Frank I.; and Pearson, Samuel J., to Whirlpool Corporation. Combined microwave oven and refrigerator. T973,013, 8-1-78, Cl. 312-237.000.

Frantzreb, John G., Sr., to Caterpillar Tractor Co. Apparatus and method for heating a controlled, moving wire containing treating agents. T973,009, 8-1-78, Cl. 164-50.000.

Freilich, John Douglas: *See*—
Shull, Samuel Ellsworth; and Freilich, John Douglas, T973,016, Cl. 548-312.000.

Glyco Chemicals, Inc.: *See*—
Shull, Samuel Ellsworth; and Freilich, John Douglas, T973,016, Cl. 548-312.000.

Hyche, Kenneth W.; and Schick, Martin F. Compositions suitable for making floor tile. T973,012, 8-1-78, Cl. 260-23.00H.

International Business Machines Corporation: *See*—
Kaplan, Leon H.; Viswanathan, Nungavaram S.; and Zimmerman, Steven M., T973,008, Cl. 134-3.000.

Kaplan, Leon H.; Viswanathan, Nungavaram S.; and Zimmerman, Steven M., to International Business Machines Corporation. Method for removing layers of organic material. T973,008, 8-1-78, Cl. 134-3.000.

Kelly, Orson K.; and Perez, Henry J., to Caterpillar Tractor Co. Lever locking assembly. T973,003, 8-1-78, Cl. 70-200.000.

Kendall, Victor George: *See*—
Chadwick, Julian Burrell; and Kendall, Victor George, T973,015, Cl. 428-36.000.

Klett, Gene R., to Caterpillar Tractor Co. Replaceable corner cutting edge. T973,002, 8-1-78, Cl. 37-142.00R.

Lofquist, Byron H.: *See*—
Shyu, Tsu Pin; and Lofquist, Byron H., T973,005, Cl. 74-574.000.

Mann, Horace C., Jr.: *See*—
Stinson, John M.; Mann, Horace C., Jr.; and McCullough, John F., T973,004, Cl. 71-29.000.

McCullough, John F.: *See*—
Stinson, John M.; Mann, Horace C., Jr.; and McCullough, John F., T973,004, Cl. 71-29.000.

McDonald, Kenneth Herbert. Electrical conductor systems. T973,010, 8-1-78, Cl. 191-23.00A.

Ohms, Edward J.: *See*—
Cole, Carroll R.; and Ohms, Edward J., T973,001, Cl. 37-126.0AD.

Pearson, Samuel J.: *See*—
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Rambold, Adolf. Immersible bag for exhaustable substances. T973,014, 8-1-78, Cl. 426-83.000.

Schick, Martin F.: *See*—
Hyche, Kenneth W.; and Schick, Martin F., T973,012, Cl. 260-23.00H.

Shull, Samuel Ellsworth; and Freilich, John Douglas, to Glyco Chemicals, Inc. Cyanoethylation of hydantoins. T973,016, 8-1-78, Cl. 548-312.000.

Shyu, Tsu Pin; and Lofquist, Byron H., to Caterpillar Tractor Co. Tuned viscous damper. T973,005, 8-1-78, Cl. 74-574.000.

Stinson, John M.; Mann, Horace C., Jr.; and McCullough, John F., to Tennessee Valley Authority. Production of urea-ammonium polyphosphates from urea phosphate. T973,004, 8-1-78, Cl. 71-29.000.

Tennessee Valley Authority: *See*—
Stinson, John M.; Mann, Horace C., Jr.; and McCullough, John F., T973,004, Cl. 71-29.000.

Viswanathan, Nungavaram S.: *See*—
Kaplan, Leon H.; Viswanathan, Nungavaram S.; and Zimmerman, Steven M., T973,008, Cl. 134-3.000.

Waghorn, Peter Ernest. Calenderable propylene polymer compositions. T973,011, 8-1-78, Cl. 260-23.00H.

Whirlpool Corporation: *See*—
Ferrara, Frank I.; and Pearson, Samuel J., T973,013, Cl. 312-237.000.

Zimmerman, Steven M.: *See*—
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF AUGUST, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Brockway, Richard J.: *See*—
Hayner, Paul F.; and Brockway, Richard J., Re. 29,714, Cl. 138-42.000.

Caterpillar Tractor Co.: *See*—
Reinsma, Harold L.; and Proksch, Frederick D., Re. 29,718, Cl. 305-57.000.

Clampitt, Richard L.; and Hessert, James E., to Phillips Petroleum Company. Method of drilling a borehole using gelled polymers. Re. 29,716, Cl. 175-65.000.

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Elkhart Brass Manufacturing Co., Inc.: *See*—
Thompson, William S., Re. 29,717, Cl. 239-107.000.

Hayner, Paul F.; and Brockway, Richard J., to Sanders Associates, Inc. Fluid flow restrictor. Re. 29,714, Cl. 138-42.000.

Hessert, James E.: *See*—
Clampitt, Richard L.; and Hessert, James E., Re. 29,716, Cl. 175-65.000.

Hunter, Edward W.: *See*—
Richards, George B.; Swain, Leonard W.; and Hunter, Edward W., Re. 29,715, Cl. 141-226.000.

Masson Scott Thrissell Engineering Limited: *See—*
Craddy, Richard Adrian, Re. 29,713, Cl. 83-674.000.
Phillips Petroleum Company: *See—*
Clampitt, Richard L.; and Hessert, James E., Re. 29,716, Cl. 175-65.000.
Proksch, Frederick D.: *See—*
Reinsma, Harold L.; and Proksch, Frederick D., Re. 29,718, Cl. 305-57.000.
Reinsma, Harold L.; and Proksch, Frederick D., to Caterpillar Tractor Co. Resilient mid-pitch lug for an endless track. Re. 29,718, Cl. 305-57.000.
Richards, George B.; Swain, Leonard W.; and Hunter, Edward W., to Richards, George B. Fluidic automatic nozzle. Re. 29,715, Cl. 141-226.000.
Sanders Associates, Inc.: *See—*
Hayner, Paul F.; and Brockway, Richard J., Re. 29,714, Cl. 138-42.000.
Shipman, Paul. Double cylinder lock bolt assembly. Re. 29,712, Cl. 70-120.000.
Swain, Leonard W.: *See—*
Richards, George B.; Swain, Leonard W.; and Hunter, Edward W., Re. 29,715, Cl. 141-226.000.
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Thompson, William S., to Elkhart Brass Manufacturing Co., Inc. Automatic volume adjusting fire hose nozzle with flushing mechanism. Re. 29,717, Cl. 239-107.000.
Wicker, George Leonard, to T.B.A. Industrial Products Limited. Thermoplastic moulding compositions reinforced with a mixture of glass and asbestos fibers. Re. 29,719, Cl. 260-37.00N.

LIST OF PLANT PATENTEES

Chrysanthemum Breeder Association N.V.: *See—*
Middelburg, Nicolaas, 4,288, Cl. 74.000.
Chrysanthemum Breeders Association N.V.: *See—*
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Duffett, William E.: *See—*
Jessel, Walter H., Jr.; and Duffett, William E., 4,286, Cl. 74.000.
Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,286, 8-1-78, Cl. 74.000.
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AMF Incorporated: *See—*
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Vallfors, Bertil Sven, 248,774, Cl. D24-54.000.
Baldini, Giovanni, to Carrara & Matta S.p.A. Bathroom shelf. 248,702, 8-1-78, Cl. D6-132.000.
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Campbell, William B., 248,743, Cl. D11-140.000.
Barr, Josef J. Diamond ring. 248,741, 8-1-78, Cl. D11-33.000.
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Blann, Ellis L. Container bracket or the like. 248,730, 8-1-78, Cl. D8-363.000.
Bokmiller, David J., to Falcon Enterprises, Inc. Portable combination loudspeaker and radio mount. 248,757, 8-1-78, Cl. D14-37.000.
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Sperber, Robert. Sawmill attachment for a chain saw. 248,727, 8-1-78, Cl. D8-71.000.
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187	4,103,523

CLASS 70

120	Re.29,712
209	4,103,524
347	4,103,525
364 A	4,103,526

CLASS 71

9	4,104,048
76	4,104,049
86	4,104,050
88	4,104,052
90	4,104,053
92	4,104,051
103	4,104,054
107	4,104,043

CLASS 72

75	4,103,527
238	4,103,528
253 A	4,103,529
312	4,103,530
380	4,103,531

CLASS 73

11	4,103,532
12	4,103,533
37	4,103,534
37.5	4,103,535
40	4,103,536
40.5 R	4,103,537
81	4,103,538
86	4,103,539
88 C	4,103,540
88 R	4,103,541
105	4,103,542
114	4,103,543
115	4,103,544
141 A	4,103,545
145	4,103,546
146	4,103,547
	4,103,548
146.8	4,103,549
159	4,103,550
194 A	4,103,551
309	4,103,552
425	4,103,553
573	4,103,554
706	4,103,555

CLASS 74

25	4,103,556
102	4,103,557
230.7	4,103,558
471 XY	4,103,559
501 M	4,103,560
552	4,103,561
567	4,103,562
594.5	4,103,563
650	4,103,564
665 L	4,103,565
701	4,103,566
710	4,103,567
801	4,103,568
816	4,103,569

CLASS 75

1 R	4,104,055
33	4,104,056
49	4,104,057
60	4,104,058
134 F	4,104,059
208 CS	4,104,060
211	4,104,061
238	4,104,062
243	4,104,063

CLASS 76

110	4,103,570

CLASS 81

74	4,103,571
418	4,103,572

CLASS 82

93	4,103,573

CLASS 83

140	4,103,574
298	4,103,575
320	4,103,576
337	4,103,577
409	4,103,578
435.1	4,103,579
663	4,103,580
674	Re.29,713

CLASS 84

1.24	4,103,581
	4,103,582
291	4,103,583

CLASS 86

1 R	4,103,584

CLASS 89

1.814	4,103,585
144	4,103,586
175	4,103,587

CLASS 90

11 A	4,103,588
56 R	4,103,589

CLASS 91

376 R	4,103,590
417 R	4,103,591
448	4,103,592

CLASS 92

78	4,103,593
159	4,103,594

CLASS 93

58.3	4,103,595
77 FT	4,103,596

CLASS 96

1 PE	4,104,064
1 SD	4,104,066
1.5 R	4,104,065
	4,104,067
3	4,104,068
23	4,104,069
36	4,104,070
41	4,104,071
68	4,104,072

CLASS 98

2.12	4,103,597
31	4,103,598
33 A	4,103,599
66 R	4,103,600
110	4,103,601

CLASS 99

289 D	4,103,602
294	4,103,603
342	4,103,604
345	4,103,605
443 C	4,103,606
548	4,103,607

CLASS 100

53	4,103,608
218	4,103,609
232	4,103,610
257	4,103,611

CLASS 101

1	4,103,612
93.03	4,103,617
115	4,103,613
	4,103,614
120	4,103,615
467	4,103,616

CLASS 102

22 R	4,103,618
28 R	4,103,619
38 PP	4,103,620
95	4,103,621

CLASS 104

7 R	4,103,622

CLASS 105

197 DB	4,103,623
199 CB	4,103,624

CLASS 106

15 FP	4,104,073
40 V	4,104,074
44	4,104,075
52	4,104,076
88	4,104,077

CLASS 108

44	4,103,625
127	4,103,626

CLASS 110

281	4,103,627

CLASS 111

52	4,103,628

CLASS 112

79 R	4,103,629
	4,103,630
80	4,103,631
158 E	4,103,632
217.1	4,103,633
266	4,103,635
	4,103,636
439	4,103,634

CLASS 113

116 M	4,103,637

CLASS 114

144 E	4,103,638

CLASS 116

114 AH	4,103,640
117 C	4,103,641
174	4,103,642

CLASS 118

50	4,103,643
62	4,103,644

CLASS 119

95	4,103,645

CLASS 122

4 D	4,103,646
483	4,103,647

CLASS 123

30 R	4,103,648
32 EE	4,103,649
41.86	4,103,650
50 B	4,103,651
103 R	4,103,652
117 R	4,103,653
119 B	4,103,655
119 EC	4,103,654
122 D	4,103,656
127	4,103,657
133	4,103,658
148 DC	4,103,659
179 H	4,103,661
179 K	4,103,660
188 GC	4,103,662
188 S	4,103,663
191 L	4,103,664
196 R	4,103,665
219	4,103,666

CLASS 124

24 R	4,103,667

CLASS 125

11 CD	4,103,668

CLASS 126

121	4,103,669
	4,103,670
200	4,103,671
270	4,103,672
271	4,103,673
	4,103,674
	4,103,675
299 E	4,103,676

CLASS 127

46 R	4,104,078

CLASS 128

2 V	4,103,677
2.05 F	4,103,679
2.05 V	4,103,678
6	4,103,680
71	4,103,681
87 A	4,103,682
92 BA	4,103,683
173 H	4,103,684
214 R	4,103,685
	4,103,686
	4,103,687
303.17	4,103,688
350 V	4,103,689
418	4,103,690

CLASS 130

24 4,103,691

CLASS 131

32 4,103,692

CLASS 132

46 R 4,103,693
73.6 4,103,694

CLASS 134

2 4,104,079
23 4,104,080
4,104,081
73 4,103,698
141 4,104,082

CLASS 136

89 CC 4,104,084
89 H 4,104,083

CLASS 137

1 4,103,695
14 4,103,696
45 4,103,697
106 4,103,699
172 4,103,700
375 4,103,701
4,103,702
501 4,103,703
522 4,103,704
544 4,103,705
574 4,103,706
604 4,103,707
614.11 4,103,708
615 4,103,709
624.13 4,103,710
625.66 4,103,711
637.05 4,103,712

CLASS 138

42 Re.29,714
133 4,103,713
145 4,103,800

CLASS 139

1 C 4,103,714
33 4,103,715
54 4,103,716
383 A 4,103,717

CLASS 140

105 4,103,718
147 4,103,719

CLASS 141

1 4,103,720
6 4,103,721
70 4,103,722
226 Re.29,715

CLASS 144

34 E 4,103,723
193 A 4,103,724

CLASS 148

1.5 4,104,085
4,104,086
4,104,087
12 R 4,104,088
32.5 4,104,089
175 4,104,090
188 4,104,091

CLASS 149

2 4,104,092
40 4,104,093

CLASS 151

35 4,103,725

CLASS 152

330 R 4,103,726

CLASS 156

83 4,104,095
89 4,104,096
143 4,104,097
149 4,104,098
155 4,104,099
285 4,104,101
298 4,104,102
309 4,104,103
345 4,104,104
364 4,104,105
384 4,104,106
473 4,104,107
500 4,104,094
510 4,104,108
521 4,104,109
523 4,104,110
656 4,104,111

CLASS 159

4 R 4,104,112

CLASS 160

168 R 4,103,727
368 R 4,103,728

CLASS 162

19 4,104,113
29 4,104,114
100 4,104,115
343 4,104,116

CLASS 164

12 4,103,729
49 4,103,730
147 4,103,731
4,103,732
160 4,103,733
309 4,103,734

CLASS 165

39 4,103,735
48 R 4,103,736
80 4,103,737
178 4,103,738

CLASS 166

105 4,103,739
117.5 4,103,740
147 4,103,741
282 4,103,742
299 4,103,743
324 4,103,744

CLASS 173

57 4,103,745
107 4,103,746
119 4,103,747

CLASS 174

22 R 4,104,479
23 C 4,104,480
28 4,104,481
87 4,104,482
138 R 4,104,483
151 4,104,484

CLASS 175

61 4,103,748
65 Re.29,716
70 4,103,749

CLASS 176

20 R 4,104,117
38 4,104,118
4,104,119
50 4,104,120
86 L 4,104,122
86 R 4,104,121

CLASS 177

1 4,103,750
122 4,103,751
141 4,103,752

CLASS 179

1 HF 4,104,485
2 AM 4,104,486
6 E 4,104,487
18 FA 4,104,488
100.3 G 4,104,489

CLASS 180

49 4,103,753
82 C 4,103,754
117 4,103,755

CLASS 181

121 4,103,756

CLASS 182

2 4,103,757
3 4,103,758

CLASS 184

64 4,103,759

CLASS 188

1 B 4,103,760
73.5 4,103,761
352 4,103,762

CLASS 192

2 4,103,763
4 A 4,103,764
58 B 4,103,765

CLASS 195

31 P 4,104,123
33 4,104,124
66 R 4,104,125
103.5 A 4,104,126
127 4,104,127

CLASS 197

62 4,103,766

CLASS 198

366 4,103,767
778 4,103,768
781 4,103,769

CLASS 200

44 4,104,490
50 A 4,104,491
51.14 4,104,492
61.45 R 4,104,493
67 G 4,104,494
83 P 4,104,495
144 B 4,104,496
305 4,104,497

CLASS 201

4 4,104,128
17 4,104,129

CLASS 202

230 4,104,130

CLASS 203

7 4,104,131

CLASS 204

12 4,104,132
25 4,104,133
37 R 4,104,134
37 T 4,104,135
38 B 4,104,136
43 T 4,104,137
44 4,104,138
55 R 4,104,139
78 4,104,140
4,104,141
152 4,104,142
159.15 4,104,143
159.23 4,104,144
162 R 4,104,145
165 4,104,146
181 C 4,104,147
181 R 4,104,100
242 4,104,148

CLASS 206

45.2 4,103,774
193 4,103,770
219 4,103,771
222 4,103,772
315 B 4,103,773
455 4,103,775

CLASS 208

64 4,104,149
91 4,104,150
111 4,104,151
112 4,104,152
138 4,104,153
4,104,154
235 4,104,155

CLASS 209

43 4,103,777
73 4,103,776
74 R 4,104,156
166 4,104,157

CLASS 210

25 4,104,158
28 4,104,159
36 4,104,160
54 4,104,161
63 R 4,104,162
80 4,104,163
136 4,104,164
191 4,104,165
195 R 4,104,166
195 S 4,104,167
297 4,104,168
331 4,104,169
487 4,104,170

CLASS 211

47 4,103,778
65 4,103,779
68 4,103,780
86 4,103,781
126 4,103,782

CLASS 212

48 4,103,783
94 4,103,784

CLASS 214

1 HA 4,103,831
6.5 4,103,785
7 4,103,786
16.1 A 4,103,787
17 DA 4,103,788
41 R 4,103,789
80 4,103,790
86 A 4,103,799
138 R 4,103,791
152 4,103,792
506 4,103,793
518 4,103,794
621 4,103,795
766 4,103,796

CLASS 215

209 4,103,797
305 4,103,798

CLASS 219

10.43 4,104,498
60 A 4,104,499
69 E 4,104,503
69 M 4,104,501
69 V 4,104,500
69 W 4,104,502
73.1 4,104,504
76.16 4,104,505
85 CM 4,104,506
513 4,104,507
521 4,104,508
544 4,104,509

CLASS 220

203 4,103,801
258 4,103,802
270 4,103,803
281 4,103,804
331 4,103,805

CLASS 222

3 4,103,806

CLASS 224

1 R 4,103,807
4 D 4,103,808
5 R 4,103,809
29 R 4,103,810
45 AA 4,103,811
45 P 4,103,812

CLASS 228

2.5 4,103,813
6 A 4,103,814
9 4,103,815
49 4,103,816
173 C 4,103,817

CLASS 229

15 4,103,818
33 4,103,819
37 R 4,103,820
74 4,103,821

CLASS 233

20 A 4,103,822

CLASS 235

64.7 4,104,510
132 R 4,104,511
312 4,103,823
450 4,104,513
466 4,104,514
488 4,104,515

CLASS 236

34.5 4,103,824

CLASS 237

1 A 4,103,825
55 4,103,826

CLASS 239

8 4,103,827
107 Re.29,717
206 4,103,828
304 4,103,829
587 4,103,830

CLASS 241

38 4,103,832

CLASS 242

18 A 4,103,833
4,103,835
18 PW 4,103,834
35.6 E 4,103,836
46.21 4,103,837
55.2 4,103,838
56.2 4,103,839
67.3 R 4,103,840
86.2 4,103,841
107 4,103,843
4,103,844
107.4 A 4,103,842
107.7 4,103,845
205 4,103,846

CLASS 244

3.18 4,103,847
17.13 4,103,848
63 4,103,849
153 R 4,103,850

CLASS 246

63 C 4,103,851

CLASS 248

178 4,103,852
219.1 4,103,853
235 4,103,854
246 4,103,855
4,103,856
346 4,103,857
399 4,103,858
425 4,103,859
467 4,103,860

CLASS 249

20 4,103,861
53 R 4,103,862

CLASS 250

204 4,104,517
213 VT 4,104,516
221 4,104,518
274 4,104,519
315 R 4,104,520
324 4,104,521
359 4,104,522
370 4,104,523
402 4,104,524
4,104,525
403 4,104,526
445 T 4,104,527
451 4,104,528
470 4,104,529
490 4,104,530
4,104,531
4,104,532
551 4,104,533

CLASS 251

48 4,103,863
63.6 4,103,864
148 4,103,865
151 4,103,866
180 4,103,867
283 4,103,868

CLASS 252

8.1 4,104,172
8.3 4,104,171
8.55 D 4,104,174
8.55 R 4,104,173
8.57 4,104,175
12.2 4,104,176
30 4,104,178
32.7 E 4,104,179
33 4,104,180
46.7 4,104,181
51.5 A 4,104,177
4,104,182
62.1 L 4,104,183
63.7 4,104,184
70 4,104,185
89 R 4,104,186
106 4,104,187
182.1 4,104,188
186 4,104,189
187 R 4,104,190
188 4,104,191
4,104,192
316 4,104,193
350 4,104,195
390 4,104,194
404 4,104,196
425.3 4,104,197
429 B 4,104,198
430 4,104,199
465 4,104,200
466 B 4,104,201
522 4,104,202
4,104,203

CLASS 254

86 R 4,103,869
88 4,103,870
164 4,103,871
168 4,103,872
4,103,873

CLASS 256

24 4,103,874
59 4,103,875

CLASS 260

2.3 4,104,205
4,104,206
4 R 4,104,210
8 4,104,211
17.3 4,104,212
4,104,213
17.4 CL 4,104,214
22 CB 4,104,215
23 AR 4,104,216
23 XA 4,104,217
23.7 H 4,104,218
27 BB 4,104,272
29.2 E 4,104,222
29.2 EP 4,104,223
29.2 N 4,104,221
29.4 R 4,104,224
29.6 F 4,104,225
29.6 HN 4,104,227
29.6 NR 4,104,228
4,104,230
29.6 R 4,104,220
29.6 RB 4,104,219
29.6 RW 4,104,229
29.6 WB 4,104,226
30.8 R 4,104,231
31.6 4,104,232
31.8 HA 4,104,233
33.2 R 4,104,235
4,104,236
33.6 UA 4,104,234
37 EP 4,104,238
37 N Re.29,719
37 SB 4,104,237
4,104,239
39 P 4,104,240
40 R 4,104,241
4,104,242
42.14 4,104,243
42.41 4,104,289
45.7 R 4,104,244
4,104,247
45.7 S 4,104,245
4,104,246
45.8 N 4,104,248
4,104,249
4,104,251
45.8 NT 4,104,250
45.8 NZ 4,104,254
45.8 R 4,104,252
45.8 RW 4,104,253
45.95 C 4,104,255
45.95 D 4,104,256
112 B 4,104,266
112.5 S 4,104,267
158 4,104,268
162 4,104,269
205 4,104,270
239.57 4,104,271
294.9 4,104,273
295 AM 4,104,274
297 B 4,104,275
314.5 4,104,276
4,104,277
326 N 4,104,279
326.13 A 4,104,278
327 B 4,104,280
343.3 R 4,104,281
345.3 4,104,282
348.43 4,104,283
378 4,104,284
397.1 4,104,285
397.25 4,104,286
404 4,104,287
412.8 4,104,288
428.5 4,104,290
429.7 4,104,292
429.9 4,104,291
438.5 R 4,104,293
448 C 4,104,294
448.2 N 4,104,295
448.8 R 4,104,296
543 P 4,104,299
4,104,304
543 R 4,104,298
544 D 4,104,300
554 4,104,301
561 S 4,104,302
563 P 4,104,305
570.9 4,104,303
571 4,104,306
583 G 4,104,307
586 R 4,104,308
606.5 P 4,104,309
610 B 4,104,310
4,104,311
4,104,312
612 R 4,104,313
614 F 4,104,314
650 R 4,104,315
655 4,104,316
666 A 4,104,317
669 A 4,104,318
671 C 4,104,319
673.5 4,104,320
677 A 4,104,321
827 4,104,322
829 4,104,323
857 TW 4,104,324
873 4,104,261
876 B 4,104,326
4,104,327
876 R 4,104,325
4,104,328
878 R 4,104,329
880 B 4,104,330
4,104,331
4,104,332
885 4,104,333
888 4,104,334
897 A 4,104,335
4,104,336

CLASS 261

39 A 4,104,337
114 TC 4,104,338

CLASS 264

1 4,104,339
6 4,104,340
9 4,104,341
12 4,104,342
40.1 4,104,343

42 4,104,344
43 4,104,345
51 4,104,346
60 4,104,395
89 4,104,394
113 4,104,347
121 4,104,348
153 4,104,349
225 4,104,350
236 4,104,351
250 4,104,352
255 4,104,353
4,104,357
262 4,104,354
290 R 4,104,355
297 4,104,356

CLASS 266

51 4,103,877
78 4,103,878
158 4,103,879
253 4,103,880

CLASS 267

177 4,103,881

CLASS 269

51 4,103,882
71 4,103,883

CLASS 271

18.3 4,103,884
117 4,103,885

CLASS 272

3 4,103,886
77 4,103,889
123 4,103,887

CLASS 273

1 E 4,103,890
33 4,103,888
97 R 4,103,891
101.1 4,103,892
106.5 D 4,103,893
126 A 4,103,894
153 R 4,103,895
183 D 4,103,896
188 A 4,103,897
248 4,103,898

CLASS 277

1 4,103,899
2 4,103,900
9.5 4,103,901
12 4,103,902
27 4,103,903
42 4,103,904
56 4,103,905
88 4,103,906
96.1 4,103,907
96.2 4,103,908
101 4,103,909
165 4,103,910
210 4,103,911
226 4,103,912
235 B 4,103,913

CLASS 279

4 4,103,914
119 4,103,915

CLASS 280

11.28 4,103,917
79.1 A 4,103,919
112 A 4,103,920
154.5 R 4,103,918
267 4,103,921
279 4,103,922
289 L 4,103,923
289 R 4,103,924
414 A 4,103,925
414 R 4,103,926
482 4,103,927
490 R 4,103,928
605 4,103,916
611 4,103,929
614 4,103,930
656 4,103,931
718 4,103,932
744 4,103,933
4,103,934

CLASS 283

66 R 4,103,935

CLASS 285

26 4,103,936
110 4,103,937
136 4,103,938
137 A 4,103,939
189 4,103,940
238 4,103,941
276 4,103,942
419 4,103,943

CLASS 289

18 4,103,944

CLASS 290

37 A 4,104,534
52 4,104,535
54 4,104,536

CLASS 292

100 4,103,945
114 4,103,946
194 4,103,947
256 4,103,948
342 4,103,949
346 4,103,950

CLASS 293

71 P 4,103,951

CLASS 294

1 R 4,103,952
19 R 4,103,953
54 4,103,954
92 4,103,955

CLASS 296

1 S 4,103,957
10 4,103,956
23 C 4,103,958
23 MC 4,103,959
37.1 4,103,960
63 4,103,961
137 E 4,103,962

CLASS 297

192 4,103,965
195 4,103,966
216 4,103,967
219 4,103,968
311 4,103,969
363 4,103,970
367 4,103,964

CLASS 299

4 4,103,963
17 4,103,971
18 4,103,972
39 4,103,973
43 4,103,974
4,103,975

CLASS 303

38 4,103,976
4,103,977

CLASS 305

57 Re.29,718

CLASS 307

58 4,104,537
64 4,104,538
4,104,539
114 4,104,540
141 4,104,541
4,104,542
221 D 4,104,543
297 4,104,544
351 4,104,545
362 4,104,546
4,104,547

CLASS 308

9 4,103,978
160 4,103,979

CLASS 310

14 4,104,548
26 4,104,549
71 4,104,550
88 4,104,551
156 4,104,552
352 4,104,553

CLASS 312

185 4,103,980
257 A 4,103,981

CLASS 313

447 4,104,554
512 4,104,555

CLASS 315

39 4,104,556
4,104,557
4,104,558
39.51 4,104,559
83 4,104,560
101 4,104,561
158 4,104,562
169 TV 4,104,563
171 4,104,564
178 4,104,565
371 4,104,566
387 4,104,567
394 4,104,568
408 4,104,569

CLASS 318

318 4,104,570
380 4,104,571
631 4,104,572
640 4,104,573
696 4,104,574

CLASS 323

4 4,104,575
102 4,104,576

CLASS 324

0.5 F 4,104,577
28 CR 4,104,578
29 4,104,579
29.5 4,104,580
52 4,104,581
4,104,582
58 A 4,104,583
58.5 C 4,104,585
58.5 R 4,104,584
83 D 4,104,586
95 4,104,587
110 4,104,588
158 F 4,104,589
166 4,104,590
205 4,104,591

CLASS 325

37 4,104,592
392 4,104,593
475 4,104,594

CLASS 328

1 4,104,595

CLASS 330

9 4,104,596
43 4,104,597

CLASS 331

94.5 M 4,104,598
116 R 4,104,599

CLASS 333

79 4,104,600

CLASS 335

6 4,104,601
61 4,104,602
306 4,104,603

CLASS 337

248 4,104,604

CLASS 338

2 4,104,605
198 4,104,606
309 4,104,607

CLASS 339

91 R 4,103,982
4,103,983
98 4,103,984
126 R 4,103,985
272 UC 4,103,986

CLASS 340

3 C 4,104,609
3 PS 4,104,608
15 4,104,610
15.5 F 4,104,611
27 AT 4,104,612
52 D 4,104,613
81 R 4,104,614
84 4,104,615
146.3 Y 4,104,616
147 R 4,104,617
324 AD 4,104,624
324 M 4,104,626
324 R 4,104,625
336 4,104,627
384 E 4,104,628
524 4,104,618
572 4,104,622
576 4,104,621
629 4,104,619
642 4,104,620

CLASS 343

6 R 4,104,629
6.5 R 4,104,630
7 A 4,104,631
4,104,633
7 VM 4,104,632
18 C 4,104,634
103 4,104,635
106 D 4,104,636
106 R 4,104,637
112 CA 4,104,638
723 4,104,639
765 4,104,640
844 4,104,641
882 4,104,642

CLASS 346

17 4,104,643
139 A 4,104,644
140 R 4,104,645
4,104,646
158 4,104,647
163 4,104,648

CLASS 350

96.21 4,103,987
162 R 4,103,988
199 4,103,989
4,103,990
297 4,103,991

CLASS 351

160 4,103,992

CLASS 352

140 4,103,993

CLASS 354

25 4,104,650
4,104,651
4,104,652
27 4,104,653
31 4,104,654
38 4,104,655
43 4,104,656
50 4,104,657
106 4,104,658
170 4,104,659
171 4,104,660
173 4,104,661
187 4,104,662
197 4,104,663
213 4,104,664
226 4,104,665
234 4,104,666
250 4,104,667
289 4,104,649
293 4,104,623
299 4,104,668
304 4,104,669
324 4,104,670
337 4,104,671

CLASS 355

3 R 4,103,994
14 4,103,995
32 4,103,996

CLASS 356

104 4,103,997
152 4,103,998

CLASS 357

22 4,104,672
4,104,673
30 4,104,674
54 4,104,675
79 4,104,676
81 4,104,677

CLASS 358

30 4,104,678
44 4,104,679
132 4,104,680
141 4,104,681

CLASS 360

2 4,104,682
9 4,104,683
70 4,104,684
84 4,104,685
132 4,104,686

CLASS 361

17 4,104,687
28 4,104,688
44 4,104,689
45 4,104,690
96 4,104,691
106 4,104,692
120 4,104,693
172 4,104,694
220 4,104,695
229 4,104,696
305 4,104,697
321 4,104,698
349 4,104,699
384 4,104,700
386 4,104,701
421 4,104,702
426 4,104,703
433 4,104,704

CLASS 362

5 4,104,705
10 4,104,706
17 4,104,707
34 4,104,708
105 4,104,709
130 4,104,710
153 4,104,711
218 4,104,712
294 4,104,713

CLASS 363

21 4,104,714
37 4,104,715
102 4,104,716

CLASS 364

200 4,104,717
4,104,718
4,104,719
4,104,720
4,104,721
439 4,104,512
455 4,104,722
475 4,104,723
477 4,104,724
487 4,104,725
518 4,104,726
710 4,104,727
712 4,104,728
757 4,104,729
815 4,104,730
900 4,104,731

CLASS 365

179 4,104,732
189 4,104,733
228 4,104,734
230 4,104,735

CLASS 366

2 4,104,736
65 4,104,737
178 4,103,876
343 4,104,738

CLASS 401

134 4,103,999

CLASS 403

7 4,104,000

CLASS 404

133 4,104,001

CLASS 415

119 4,104,002

CLASS 416

141 4,104,003

CLASS 417

313 4,104,004
334 4,104,006
360 4,104,007
394 4,104,005
397 4,104,008

CLASS 418

48 4,104,009
76 4,104,010
121 4,104,011

CLASS 423

21 4,104,358
139 4,104,359
213.2 4,104,360
239 4,104,361
315 4,104,362
338 4,104,363
481 4,104,364
531 4,104,365

CLASS 424

1 4,104,366
4,104,367
60 4,104,368
115 4,104,369
153 4,104,370
177 4,104,371
180 4,104,372
185 4,104,374
195 4,104,373
200 4,104,375
216 4,104,376
222 4,104,377
225 4,104,378
244 4,104,379
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246 4,104,381
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247 4,104,382
248.4 4,104,383
248.51 4,104,384
250 4,104,385
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4,104,388
251 4,104,389
256 4,104,390
258 4,104,392
263 4,104,393
267 4,104,396
4,104,397
4,104,398
269 4,104,399
270 4,104,400
303 4,104,401
330 4,104,402
365 4,104,403

CLASS 425

299 4,104,012
324.1 4,104,013
345 4,104,014
382.2 4,104,015

CLASS 426

94 4,104,405
99 4,104,406
4,104,407
135 4,104,408
386 4,104,409
399 4,104,410
421 4,104,411
572 4,104,412
582 4,104,413
599 4,104,414
656 4,104,415

CLASS 427

29 4,104,416
37 4,104,417
42 4,104,418
46 4,104,419
74 4,104,420
96 4,104,421
123 4,104,422
402 4,104,423
435 4,104,424

CLASS 428

12 4,104,425
35 4,104,404
36 4,104,426
68 4,104,427
85 4,104,428
151 4,104,429
175 4,104,430
211 4,104,431
216 4,104,432
245 4,104,433
273 4,104,434
288 4,104,435
297 4,104,436
307 4,104,437
332 4,104,438
397 4,104,439
402 4,104,440
408 4,104,441
428 4,104,442
474 4,104,443
4,104,444
567 4,104,445
585 4,104,446

CLASS 429

15 4,104,447
72 4,104,448
110 4,104,449
194 4,104,450
4,104,451

CLASS 431

54 4,104,016
352 4,104,017

CLASS 432

29 4,104,018

CLASS 521

32 4,104,204
53 4,104,208
62 4,104,209
84 4,104,207

CLASS 526

3 4,104,452
10 4,104,453
62 4,104,454
173 4,104,455
174 4,104,465
194 4,104,456
203 4,104,457
264 4,104,458

CLASS 528

46 4,104,265
102 4,104,257
169 4,104,259
279 4,104,263
289 4,104,297
295 4,104,262
323 4,104,260
334 4,104,258
370 4,104,264
499 4,104,459

CLASS 536

3 4,104,460
23 4,104,461
26 4,104,462
56 4,104,463
115 4,104,464

CLASS 542

433 4,104,466
442 4,104,467
447 4,104,468

CLASS 544

27 4,104,469
4,104,470
178 4,104,471

CLASS 548

337 4,104,472
342 4,104,473

CLASS 560

53 4,104,474
56 4,104,475
61 4,104,476
122 4,104,477

CLASS 568

885 4,104,478

CLASSIFICATION OF DESIGNS

D4—	25	248,696			248,713		363	248,730		205	248,747		122	248,764			248,780
D6—	32	248,697			248,714	D9—	187	248,731		207	248,748	D16—	29	248,765	D27—	04	248,781
	49	248,698		6	248,715		194	248,732		211	248,749		50	248,766	D30—	12	248,782
	63	248,699		61	248,716	D10—	46	248,733	D13—	17	248,750	D22—	23	248,767	D34—	5 CH	248,785
		248,701			248,717		78	248,734		21	248,751	D23—	49	248,768		5 GH	248,783
	70	248,700			248,718		114	248,735			248,752		69	248,769		5 VV	248,784
	132	248,702		70	248,719		125	248,736	D14—	1	248,753		127	248,770		15 V	248,786
	146	248,703		85	248,720			248,737		5	248,754	D24—	33	248,771	D48—	2	248,787
	150	248,704			248,721			248,738		11	248,755			248,772			248,788
	158	248,705		88	248,722			248,739		33	248,756		36	248,773			248,789
	161	248,706		137	248,723	D11—	25	248,740		37	248,757		54	248,774		4 A	248,790
	188	248,707			248,724		33	248,741		53	248,758	D25—	16	248,775		32 A	248,791
	190	248,708	D8—	14	248,725		129	248,742		68	248,759		18	248,776			248,792
	191	248,709		57	248,726		140	248,743		93	248,760		68	248,777	D52—	4 R	248,793
	235	248,710		71	248,727		143	248,744	D15—	17	248,761		74	248,778	D87—	5 G	248,794
	241	248,711		72	248,728	D12—	71	248,745		53	248,762		86	248,779	D96—	12 A	248,795
D7—	3	248,712		91	248,729		112	248,746		63	248,763						

CLASSIFICATION OF PLANTS

P.—	74	4,286			4,287			4,288									

DEFENSIVE PUBLICATIONS APPLICATIONS

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	142 R	T973,002	74—	574	T973,005			T973,007	260—	23 H	T973,011						
70—	200	T973,003	134—	3	T973,008	164—	50	T973,009			T973,012	426—	83	T973,014	548—	312	T973,016

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PATENTS

1 :	4,104,294		4,103,894		4,104,429	12 :	4,103,366		4,103,906		4,103,688
4 :	4,103,718	06 :	Re.29,712		4,104,437		4,103,379		4,103,913		4,103,753
5 :	4,104,156		4,103,367		4,104,456		4,103,423		4,103,922		4,103,793
6 :	4,103,362		4,103,368		4,104,477		4,103,435		4,103,968		4,103,868
	4,103,369		4,103,372		4,104,487		4,103,463		4,103,985		4,103,940
	4,103,373		4,103,381		4,104,512		4,103,544		4,103,992		4,103,951
	4,103,415		4,103,383		4,104,514		4,103,546		4,104,004		4,104,042
	4,103,417		4,103,401		4,104,515		4,103,572		4,104,006		4,104,054
	4,103,449		4,103,425		4,104,516		4,103,690		4,104,012		4,104,163
	4,103,453		4,103,426		4,104,520		4,103,792		4,104,030		4,104,231
	4,103,464		4,103,432		4,104,530		4,103,847		4,104,036		4,104,245
	4,103,533		4,103,504		4,104,531		4,103,875		4,104,100		4,104,246
	4,103,534		4,103,536		4,104,532		4,103,897		4,104,107		4,104,253
	4,103,537		4,103,542		4,104,543		4,103,933		4,104,149		4,104,282
	4,103,609		4,103,581		4,104,565		4,104,099		4,104,152		4,104,291
	4,103,619		4,103,584		4,104,581		4,104,164		4,104,153		4,104,391
	4,103,697		4,103,640		4,104,598		4,104,376		4,104,154		4,104,470
	4,103,738		4,103,673		4,104,612		4,104,566		4,104,155		4,104,567
	4,103,749		4,103,715		4,104,620		4,104,694		4,104,161		4,104,568
	4,103,819		4,103,737		4,104,623	13 :	4,103,390		4,104,168		4,104,628
	4,103,883		4,103,756		4,104,625		4,103,455		4,104,199		4,104,704
	4,103,895		4,103,758		4,104,633		4,103,674		4,104,212	19 :	4,103,475
	4,103,917		4,103,760		4,104,680		4,104,588		4,104,213		4,103,489
	4,103,961		4,103,766		4,104,685	16 :	4,103,531		4,104,229		4,103,493
	4,103,967		4,103,773		4,104,695		4,104,359		4,104,233		4,103,556
	4,104,034		4,103,787		4,104,700	17 :	Re.29,715		4,104,271		4,103,608
	4,104,061		4,103,849		4,104,719		Re.29,718		4,104,317		4,103,860
	4,104,118		4,103,869	08 :	4,103,410		4,103,411		4,104,321		4,103,956
	4,104,405		4,103,892		4,103,785		4,103,420		4,104,330		4,103,965
	4,104,440		4,103,925		4,103,919		4,103,465		4,104,360		4,104,463
	4,104,507		4,103,943		4,104,081		4,103,484		4,104,408		4,104,540
	4,104,510		4,103,944		4,104,098		4,103,499		4,104,428	20 :	4,103,441
	4,104,519		4,103,945		4,104,308		4,103,555		4,104,446		4,103,477
	4,104,526		4,103,950		4,104,523		4,103,559		4,104,482		4,103,557
	4,104,533		4,103,966		4,104,583		4,103,564		4,104,492		4,103,831
	4,104,538		4,104,018	09 :	4,103,376		4,103,573		4,104,495		4,103,973
	4,104,547		4,104,023		4,103,526		4,103,587		4,104,498		4,104,053
	4,104,572		4,104,028		4,103,578		4,103,606		4,104,504		4,104,142
	4,104,734		4,104,056		4,103,848		4,103,623		4,104,511		4,104,638
8 :	4,103,789		4,104,110		4,103,899		4,103,626		4,104,552		4,104,641
	4,104,703		4,104,111		4,104,021		4,103,643		4,104,595	21 :	4,103,708
9 :	4,104,120		4,104,171		4,104,252		4,103,659		4,104,687		4,103,780
	4,104,296		4,104,187		4,104,343		4,103,667	18 :	Re.29,717		4,103,806
	4,104,545		4,104,191		4,104,401		4,103,669		4,103,374		4,104,103
	4,104,630		4,104,196		4,104,577		4,103,729		4,103,386		4,104,104
01 :	4,103,548		4,104,250		4,104,711		4,103,770		4,103,561		4,104,453
	4,104,114		4,104,280	10 :	4,103,427		4,103,781		4,103,590	22 :	4,103,571
	4,104,134		4,104,333		4,103,820		4,103,798		4,103,593		4,103,710
04 :	4,103,365		4,104,339		4,104,051		4,103,811		4,103,599		4,103,741
	4,103,392		4,104,349		4,104,243		4,103,854		4,103,625		4,103,744
	4,103,510		4,104,356		4,104,279		4,103,862		4,103,628		4,103,923
	4,104,157		4,104,375		4,104,338		4,103,881		4,103,652		4,104,124
05 :	4,103,585		4,104,426		4,104,438		4,103,904		4,103,655		4,104,177

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23 : 4,103,957
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24 : 4,103,428
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28 : 4,103,853
29 : 4,103,382
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32 : 4,103,676
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33 : Re.29,714
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DESIGN PATENTS

6	:	248,734		248,725	12	:	248,741	23	:	248,700		248,724		248,729
		248,744		248,731			248,759	26	:	248,697		248,754		248,771
		248,745		248,748	13	:	248,793			248,776		248,765		248,772
		248,746		248,749	17	:	248,713			248,784		248,778	42	: 248,779
		248,775		248,763			248,714	27	:	248,742		248,780	44	: 248,740
		248,783		248,767			248,758			248,743		248,781	45	: 248,733
		248,785		248,773			248,777			248,750		248,794	48	: 248,716
06	:	248,704	09	: 248,710			248,787	34	:	248,703		248,795		248,717
		248,705		248,762			248,788			248,707	37	: 248,730		248,718
		248,708	11	: 248,735			248,789			248,722	39	: 248,715	50	: 248,782
		248,709		248,736	18	:	248,747			248,727		248,757	51	: 248,699
		248,711		248,737			248,753			248,728		248,769		248,701
		248,712		248,738	19	:	248,761	36	:	248,696	41	: 248,706	55	: 248,768
		248,719		248,739	20	:	248,790			248,723				

PLANT PATENTS

54	:	4,286									

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

01	:	T973,004	T973,002	T973,005	T973,007	18	:	T973,013	42	:	T973,016
17	:	T973,001	T973,003	T973,006	T973,009	36	:	T973,008	47	:	T973,012

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